



Peat Harvest Licence No. 4 – South Washow Peatland Management Plan

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1.0 Introduction

1.1 Project Overview

Sun Gro Horticulture Canada Ltd. (Sun Gro) retained Vertex Professional Services Ltd. (Vertex) to complete a Peatland Management Plan (PMP) for the proposed and operating South Washow Sphagnum peat harvest operation (hereafter referred to as “South Washow”), under Peat Harvest Licence (PHL) No. 4 (Appendix A). The PMP prepared by Vertex was submitted June 2018. Subsequently, Sun Gro retained Kontzamanis Graumann Smith MacMillan Inc. (KGS Group) in August 2018 to review the PMP and recommend revisions, which have been incorporated into this document, in response to review comments received from the Forestry and Peatlands Branch. The PMP has been prepared in accordance with *Manitoba’s Submission Guidelines for Peatland Management Plans - Peatland Management Guidebook* to fulfill the requirements of *The Peatlands Stewardship and Related Amendments Act* (Manitoba Sustainable Development, 2017a; Government of Manitoba, 2015a).

1.2 Background

There are an estimated 19,000,000 ha of peatlands in Manitoba, 17% of all Canadian peatlands (Tarnocai et al., 2011), and Manitoba’s peat industry accounts for approximately 11% of Canada’s production (Canadian Sphagnum Peat Moss Association, 2015). Within Manitoba, South Washow is located in the Mid-Boreal Lowland Ecoregion of the Boreal Plain Ecozone (Smith et al., 1998).

South Washow is located approximately 45 km north of Riverton, Manitoba, on Crown Land in the Rural Municipality (R.M.) of Bifrost-Riverton (Sugar Creek Dand E) and unincorporated census Division 19 (Ramsay Point, Sugar Creek A, B and C) (Figures 1 and 2). Land uses in the area include peat harvesting, agriculture, forestry, sand and gravel quarries, fishing, hunting, trapping, and recreation.

The PHL subareas, Ramsay Point and Sugar Creek A, B, C, D and E are located within or bordering the Moose Creek Wildlife Management Area and Provincial Forest, the Fisher River First Nation (Reserve No. 44 and No. 44A) Community Interest Zone, and the Peguis First Nations (Reserve No. 1B and 1C) Treaty Land Entitlement Community Interest Zone. The traditional use by these, as well as the nearby Kinonjeoshtegon (Jackhead) and Bloodvein First Nations, may be affected and should be considered as part of the Interlake Region Community Engagement Plan. Ramsay Point is also in proximity to the Beaver Creek Provincial Park; the access road to Ramsay Point was moved further south from the southern entrance to the park to minimize on-road conflict and potential for dust in the park.

South Washow is in the Evenflow Lake Region Watershed (Manitoba Conservation and Water Stewardship, 2015).

1.3 Stakeholder Engagement

A Stakeholder Engagement Plan is being developed for Sun Gro’s interlake region PHLs, including South Washow (PHL 4), Kinowow Bay (PHL 5) and North Washow (PHL 6). The Interlake Region Community Engagement Plan will be submitted to Manitoba Sustainable Development following the submission of this PMP.

Stakeholder engagement was undertaken as part of the Ramsay Point Environment Act Proposal (EAP) process. Details on the public’s questions, concerns and comments regarding the proposed peatland development can be found in the report (Kontzamanis, Graumann, Smith MacMillan Inc., 2010).

1.4 Effects and Mitigations

A full assessment of potential impacts and identification of mitigations for South Washow is listed in Appendix B. Summarized below are key issues that are the focus of regular management during ongoing operations.

Peat harvesting may impact surface water quality through the erosion and sedimentation of peat. Surface water is tested on a weekly basis to monitor pH and total suspended solids from each final discharge point and, as needed, immediately downstream of outlets and within ditches. Detailed water quality assessments are completed three times per year, during spring freshet, late-summer and autumn base-flow, to evaluate nutrient, physio-chemical and total metal parameters (Appendix B). The peat harvest operation design also incorporates strategies to mitigate impacts to water quality, including, but not limited to: buffer zones, slow flow sedimentation design, culvert control gates, pH-corrective measures and drainage works maintenance. Spills are addressed immediately following Sun Gro's Spill Response protocol (Sun Gro Horticulture Canada Ltd., 2017a).

Vegetation is also impacted by peat harvesting through habitat loss and potential colonization of disturbed areas by non-native and non-peatland species, in addition to the initial removal of living plants. To prevent and control colonization of non-native and non-peatland species, including weeds, Sun Gro has a weed control procedure, which includes employee training in weed prevention and control (Sun Gro Horticulture Canada Ltd., 2017b). A detailed list of weed mitigation and control measures is included in Appendix B.

2.0 Corporate Overview

Sun Gro is one of North America's most prominent producers of soilless growing mixes. Sun Gro has been operating in Canada since 1929, from 25 production/distribution facilities across Canada and the United States.

Sun Gro's mission is to be an industry leader and provide superior quality growing mixes that yield exceptional results. The company has a code of ethics, which includes conducting business in a professional, honest and ethical manner, and complying with all applicable laws wherever they do business; including, but not limited to, laws relating to employment, human rights, the environment, health and safety.

Sun Gro is committed to peatland stewardship through sustainable development, restoration, and research and development. All of Sun Gro's Canadian peat production sites are Veriflora certified for environmental sustainability and product integrity. Sun Gro facilitates successful wetland restoration by only selecting bogs that can be restored to functioning wetlands and wildlife habitats, and by leaving enough natural peat to enable natural succession.

2.1 Corporate Planning Objectives

Sun Gro currently harvests peat from PHL 2 (Elma), PHL 3 (Evergreen, South Julius, North Julius, Moss Spur 2), and PHL 4 (Ramsay Point). Operations within PHLs 1, 5 and 6 are not planned to begin within the current PHL term.

Sun Gro's intention is to sustain its current level of production; doing so by opening undeveloped PHLs to replace older PHLs that are being phased into recovery. Operations at Elma (PHL 2) and Julius (PHL 3) are nearing completion and restoration of these sites is planned to begin within the next 10 to 20 years. Development of South Washow (PHL 4) began in 2014 at Ramsay Point and will continue with future phases at Ramsay Point and the preparation of Sugar Creek sub-areas.

South Washow is one of Sun Gro's newer operating PHLs. Operations have begun at Ramsay Point and new fields are being developed according to planned phasing. Sugar Creek was explored in 2017 and is proposed for development in 2021. Peat from Ramsay Point and Sugar Creek will continue to be transported to the Elma plant for processing and packaging.

2.2 Economic Development

Economic opportunities include full-time, seasonal and/or contract employment and career development for local communities, as well as commercial expenditures for supply and maintenance.

Ramsay Point employs a workforce of five full-time and 10 seasonal employees, and has a total monthly payroll of \$36,000. Ramsay Point operations also help sustain employees at the Elma plant for processing and packaging facility, where peat is shipped after harvesting. The workforce is hired from local and Indigenous communities as much as possible.

Sun Gro anticipates that, when Sugar Creek is fully operational, it will employ a workforce of three full-time and seven seasonal employees, and have a total monthly payroll of \$21,600, in addition to indirectly supporting employees at the Elma processing and packaging facility. The workforce will be hired from local and Indigenous communities as much as possible.

Other economic development stimulated by the PHL development include: contracts for harvesting merchantable timber, access road construction, culvert installation, peat transportation, waste disposal, fuel supply, hardware supply, equipment supply, and maintenance and recovery work.

2.3 Future Provincial Interests

Due to current limitations on the Government of Manitoba's issuing of new Peat Exploration Permits, Sun Gro is not actively pursuing interests outside of existing PHLs. Future provincial interests are restricted to the areas within existing PHLs. An overview of Sun Gro's PHLs in the province is presented on Figure 1 and listed in Appendix C.

3.0 Operations Overview

3.1 Licences and Permits

South Washow currently operates under PHL No. 4, issued on June 15, 2015, and valid until December 31, 2030 (Appendix A). Other previously issued and future required licences and permits are presented in Table 1.

An EAP for Ramsay Point was submitted in 2010 (Kontzamanis, Graumann, Smith MacMillan Inc., 2010). A Schedule B Amendment to Ramsay Point was submitted in May 2017, which includes amendments for the inclusion of QL-2441 and QL-2460 in SE-3-28-04-E1 and SW-14-28-04E1 (Figure 2). The amendments (65 and 64 ha, respectively) would increase the sub-area by 129 ha, from 1,659 to 1,788 ha. The proposed amended areas are included in the PMP; however, consultation with Indigenous communities and engagement with local stakeholders is ongoing and government decision is pending.

Permits required prior to the development of Sugar Creek are listed in Table 1.

3.2 Licence and Sub-area Boundaries

The South Washow PHL covers 3,467.908 ha. The full extent of the approved and proposed amendments to South Washow is presented on Figure 2. Large-scale maps of the PHL sub-areas, including all existing and proposed facilities and roads, are presented on Figures 3a, b and c.

3.3 Harvesting Schedule

The South Washow PHL is in the early stages of harvesting; portions of the bog are being harvested and others are in the process of being planned and developed. The extents of the South Washow sub-areas, with field status, are presented on Figures 3a, b and c.

3.3.1 Ramsay Point

The development schedule for Ramsay Point is as follows: 33% of the total PHL extent will be developed in the first 10 years and up to 66% of the total PHL extent will be developed over the entire lifetime of the licence. Harvesting at Ramsay Point began in 2014 and will be ongoing until approximately 2068. Development of new peat fields in the Ramsay Point sub-area is ongoing. The first field was prepared (opened) in 2013 for harvesting in 2014, a second field was prepared in October 2014, followed by a third field prepared in January/February 2017. A harvesting schedule is presented in Table 2.

3.3.2 Sugar Creek

Sugar Creek A and B are not planned for harvest within the term of the PHL. Sugar Creek C and D are proposed for harvesting beginning in 2021. Sugar Creek E will likely not be developed until after the current PHL term. A harvesting schedule similar to Ramsay Point is proposed for Sugar Creek C, D and E, with development in 33% of the total PHL extent in the first 10 years and up to 66% of the total PHL extent over the entire lifetime of the licence. Harvest at Sugar Creek is expected to have a duration of roughly 50 years, until approximately 2069. A harvesting schedule is presented in Table 2.

3.4 Harvest Area and Bulk Peat Estimates

The extent of active areas, bulk peat harvested from 2015 to 2017, and estimates anticipated until 2030 are presented in Table 3. Sun Gro's bulk peat calculations follow the formulas approved by the Director of Forestry and Peatlands in the *Peat Harvest Licence Bulk Peat Calculation Guide* (Manitoba Sustainable Development, 2017b). Estimated total harvest from South Washow between 2015 and 2030 is 4,680,000 m³.

The full extents of South Washow sub-areas, with field extent and status, are presented on Figures 3a and c.

3.4.1 Ramsay Point

By 2021, 540 ha (32.5%) of the Ramsay Point PHL sub-area will be prepared for harvesting. By 2026, all proposed fields, with a total extent of 1,064 ha (64.1% of total PHL sub-area) will be prepared and, by 2027, harvesting will be underway. Past and proposed field preparation years are presented on Figure 3a.

Annual bulk peat at full capacity is estimated at 430,000 m³ (Table 3). Future bulk peat volume estimates are based on average volumes reported for Ramsay Point since 2015. Past bulk peat volumes were calculated using the calculation formula for the conversion of total truck loads to m³ in the *Peat Harvest Licence Bulk Peat Calculation Guide* (Manitoba Sustainable Development, 2017b).

3.4.2 Sugar Creek

Sugar Creek A and B will not be harvested within the current PHL term.

By 2022, 105 ha (27.0% of total PHL sub-area) of Sugar Creek C will be prepared for harvesting and by 2030, all proposed fields, with a total extent of 140 ha (36.0%) will be prepared. Proposed field preparation years are presented on Figure 3a.

By 2022, 70 ha (17.3% of total PHL sub-area) of Sugar Creek D will be prepared for harvesting and by 2026, all proposed fields, with a total extent of 140 ha (34.5%) will be prepared. Proposed field preparation years are presented on Figure 3a.

Sugar Creek E is not proposed for harvest within the current PHL term.

Annual bulk peat in 2030 is estimated at 60,000 m³ per year at Sugar Creek C and 80,000 m³ per year at Sugar Creek D (Table 3). Future bulk peat volume estimates for Sugar Creek are based on average volumes reported for nearby Ramsay Point since 2015 and scaled to field extents at Sugar Creek. Past bulk peat volumes at Ramsay Point were calculated using the calculation formula for the conversion of total truck loads to m³ in the *Peat Harvest Licence Bulk Peat Calculation Guide* (Manitoba Sustainable Development, 2017b).

3.5 Structures

3.5.1 Ramsay Point

A laydown yard was built on 4 ha in the southeastern corner of NW-2-28-4-E1 in a Peat Surface Lease (PSL) (Figure 3a). Facilities located within the yard include an office and maintenance shop (64 m² construction trailer with washroom and shop), storage shed (18 m² steel shipping container), fuel tank island and parking area.

3.5.2 Sugar Creek

There will be no structures on Sugar Creek A or B as these areas will not be harvested.

A laydown yard will be constructed on 3 ha in the southwestern corner of SW-18-27-3-E1 in a proposed PSL within the 100 m PHL buffer of Sugar Creek C (Figure 3c). This location was selected for its proximity to the main access road and its upland location; mineral soil will provide solid ground for buildings, parking and storage of equipment. Facilities to be located within the PSL include an office and maintenance shop (64 m² construction trailer with washroom and shop), storage shed (18 m² steel shipping container), generator (30,000 watt), groundwater well, fuel tank island and parking area.

The laydown will be developed once the access road has been completed. Trees will be cleared and stumps removed, as described in Section 4.1. Topsoil and subsoil will be stockpiled, as required, for use in recovery, as described in the *Peatland Recovery Plan*. The site will then be levelled and graded to optimize drainage. If required, a ditch will be constructed around the perimeter of the PSL to manage surface water and maintain natural drainage patterns. The site will drain to the southeast into a perimeter ditch and sedimentation pond prior to release into a natural drainage outlet.

4.0 Pre-harvest Activities

4.1 Timber Removal

Timber resources will be assessed prior to tree clearing at any new areas at Ramsay Point and Sugar Creek. The assessment and removal of any merchantable timber will be arranged through the Regional Foresters, and all permits and dues will be subject to the *Forest Use and Management Regulation* under the *Forest Act* (Government of Manitoba, 2018).

Non- merchantable timber will be used for corduroy under roads, providing structure and drainage.

Tree clearing will occur in winter months when the frozen ground can support necessary equipment (e.g. wide pad crawler tractors, tractors, hydraulic excavators). Trees and their roots will be removed with a crawler tractor. Trees will be cleared only as needed and with as little time prior to harvesting time as possible. Estimated timber removal areas and sequence will coincide with field preparation presented on Figures 3a and c.

4.2 Site Access

The locations of existing and proposed access and haul roads are presented on Figures 3a and c. All roads are classified as secondary roads as they are non-permanent, but have a duration of more than 3 years (Manitoba Conservation and Water Stewardship, 2012). Construction of any new roads within wetlands will follow the best management practices laid out in *Resource Roads and Wetlands: A Guide for Planning, Construction and Maintenance* (FP Innovations, 2016) wherein cleared trees and roots are placed along road alignments (corduroy) and topped with clay and gravel. The raised grade road facilitates access by tri-axle trailers with semi-tractor units for peat loading and hauling, minimizes compaction of peat and allows for drainage.

Sun Gro's standard construction practices for access roads meet the following specifications: 10 m wide top width with a 2% minimum grade and ditches on either side. Ditches are constructed with a slope of 4:1 and a width of approximately 7.5 m. Material from the ditches is used to build the road base. Culverts are installed as needed to maintain the natural drainage pattern.

The Ramsay Point site access road originates at Provincial Road 234, 17.5 km north of the turnoff for Provincial Road 325 (Figure 3a). The access road is marked by Sun Gro signage and secured by a gate at the intersection with Provincial Road 234.

The proposed Sugar Creek site access road originates at Provincial Road 325, 12.5 km west of the turnoff from Provincial Road 234. The proposed access road would follow an existing trail, perhaps leftover from past forestry activities, for roughly 8.5 km, prior to continuing east for 1.1 km along the road allowance into the laydown area and harvest area (Figure 3c). Following the existing trail will minimize the extent of disturbance on the landscape and reduce the amount of tree clearing required. In the event that this route is not feasible, an alternate route has been designated through the upland area to the east of the trail. Both routes have been planned to utilize as much upland habitats as possible to minimize potential impacts to wetlands and natural drainage patterns. The proposed access road will be marked by Sun Gro signage and secured by a gate at the intersection with Provincial Road 325.

Haul roads are constructed as needed throughout all active sub-areas to connect the peat fields. The locations of existing and proposed haul roads are presented on Figures 3a and c.

Transport trucks will transfer the peat from both Ramsay Point and Sugar Creek to the Elma processing and packaging plant. Approximately 10 trucks per week will be required for each bog field. Once fully operational, traffic volumes per operating season (April to October) at Ramsay Point will be approximately 4,000 truckloads and at Sugar Creek approximately 2,500 truckloads.

4.3 Drainage Works

The main components of the water management system consist of lateral, perimeter and outlet ditches, overland flow, and receiving water bodies. The water management system has two primary purposes; first, to drain the peatland and facilitate dry harvest, and second, to filter outflowing water prior to its release into a natural drainage outlet. The drainage system, consisting of lateral, perimeter and outlet ditches, lowers the water level by roughly 1 m. Water filtration is achieved through slow-flowing perimeter ditches, draining the harvest area and promoting the settling of sediment.

Infield, lateral ditches drain water from the peat fields to facilitate harvest. The ditches run parallel to one another, approximately 60 m apart. Lateral ditches are constructed and maintained with a ditcher and/or a large tracked backhoe. They are roughly 1 m deep and 1 m wide at the top, narrowing to 0.4 m wide at their base. Flat slopes and small discharge rates minimize erosion in the lateral ditches. Water from lateral cross drainage ditches flows into perimeter ditches.

Perimeter ditches drain water from lateral ditches and the outside edge of bog cells. They are constructed to maintain 1 m from the top of the peat to ditch water level; therefore, their depths vary and are lowered as peat is harvested. They are roughly 2 m deep and 2 m wide at the top, narrowing to 1 m wide at their base. Perimeter ditches are constructed and maintained with a ditcher and/or a large tracked backhoe. Material excavated from perimeter ditches during maintenance is placed around the outside of the ditch and flattened slightly to form a berm. This berm prevents surface water flow into the peat fields, directs water flow around the outside of the peatland, provides access to the perimeter of the peat field and acts as a fire break. Water from perimeter ditches flows to outlet ditches prior to reaching a natural drainage outlet.

Sedimentation ponds are more commonly employed in newer peat harvest operations and were included in the development of South Washow. Sedimentation ponds at South Washow are designed to retain peat for a minimum of 2 hours to allow peat particles suspended in perimeter ditches to settle out of water before flowing out of the harvest area. Sedimentation ponds are constructed and maintained with tracked backhoe or excavator to ensure that accumulated sediment volume does not exceed 25% of total basin volume. Material excavated from sedimentation ponds during maintenance is placed in a windrow along the outside edge of the pond; material is set back from the edge to avoid sloughing. All outflowing water passes through a sedimentation pond prior to release in an outlet ditch.

Outlet ditches drain water away from the peatland into a natural drainage course or tributary. The outlet ditches serve dual function by also acting as sedimentation ponds. Their length and limited slope are designed for ponding to occur and to allow peat particles suspended in perimeter ditches to settle out of the water before flowing out of the harvest area.

Ramsay Point discharges to the southeast, with the main outlet ditch located along the access road, and ultimately flows into Lake Winnipeg.

The proposed Sugar Creek outlet will discharge to the south, be released into overland flow and ultimately flow into existing ditching and unnamed watercourses. This proposed outlet follows existing drainage patterns in the area and will minimize management required. Impacts to outflowing water quality will be monitored and mitigated as required with sedimentation ponds or other management options detailed in Appendix B. Drainage works for Sugar Creek sub-areas A and B have not been included as these sub-areas are not planned for development within the current PHL term.

The locations of the existing and proposed lateral, perimeter and outlet ditches, and sedimentation ponds are presented on Figures 4a and b.

5.0 Fire Protocols

Sun Gro has a fire hazard suppression protocol, which includes employee training in fire hazard suppression and fire control, as well as availability of water and equipment for fighting small, controllable fires, and an emergency evacuation plan for fires that are too large to control (Sun Gro Horticulture Canada Ltd., 2018a and b). This protocol meets the standards of the *Manitoba Wildfires Act* (Government of Manitoba, 2015b). Firefighting drills are held regularly to familiarize employees with equipment and test response times.

Steps are taken to prevent fire from occurring. Stockpiles are limited to 12 x 30 ft and their temperature is probed weekly to ensure that it is not excessively heating. Harvesting does not occur in high wind conditions and bulk peat transport trucks are covered with tarps. Equipment undergoes regular maintenance and is checked to ensure that exhaust systems, radiators and engines are clean, and that spark arrestors are functional. Fireguards around sites are maintained and weeds are regularly cut back to the tree line. Burning of brush and residue occurs in winter months on snow cover, and hot spot infrared scans are done after fire is put out to reduce risk of spread. If small spot fires are observed, the burning peat is gathered into a water pail to prevent spreading.

In the event of an on-site fire or wildfire, employees are trained to respond by notifying their team members or team lead. Employee mobile phones, two-way radios in trucks and equipment, and a landline phone in the main office building are the main points of contact in the event of an emergency. If the fire is too large or conditions are unsafe, all employees will evacuate and the nearest fire department will be notified (Fisher Branch or Riverton Fire Department). If the fire is small and manageable, the nearest fire department will be contacted immediately, and employees will work to limit the spread of fire.

Water can be obtained from perimeter and outlet ditches, and drainage ponds. One thousand-gallon water wagons equipped with pumps, pails, shovels and a minimum of 50 ft of fire hose are stationed at various ends of the harvest area, and designated employees are trained on how to use them. All vacuum harvesters are equipped with water jugs. Loaders, crawler tractors (D7 with ripper and D6 with winches) and crawler excavators are equipped with water jugs and a chemical fire extinguisher. All other mobile equipment is equipped with a chemical fire extinguisher; extinguishers and first aid kits are also made available in primary office and maintenance buildings. A disker, shovels, axes and chain saws are available on-site, in addition to Wajax portable fire pump backpacks.

6.0 Residual Peat Depths

Schematic illustrations of approximate pre-harvest and proposed average residual peat depths in relation to mineral soil are presented on Figures 5a and b. Baseline information regarding pre-harvest peat depth and composition has been extrapolated from numerous sources and therefore should be considered a generalization. Information used to generate schematics includes exploration records from Bannatyne (1980), in addition peat depth and humification data provided by Sun Gro (Sun Gro Horticulture Canada Ltd., 2012) for Ramsay Point and exploration records from Vertex for Sugar Creek (Vertex Professional Services Ltd., 2017).

Proposed average residual peat depth for Ramsay Point and Sugar Creek is equal to or greater than 0.5 m. This depth has been approved for Sun Gro PHLs and is determined to be sufficient to promote restoration of a peat-accumulating ecosystem by the most up to date research (Quinty and Rochefort, 2003). Water level and peat chemistry (pH) and composition may in fact be more critical in determining final restoration outcomes.

6.1 Ramsay Point

Exploration in the 1970s found up to 3.9 m of harvestable peat (Bannatyne, 1980). More recent, detailed testing indicated the total depth of peat, to mineral soil, up to 6.5 m (Sun Gro Horticulture Canada Ltd., 2012).

6.2 Sugar Creek

Peat exploration was conducted in the Sugar Creek A, B, C, D and E in November 2017; detailed information can be found in the report titled *2017 Peat Exploration Assessment – Sugar Creek Peat Harvest Licence* (Vertex Professional Services Ltd., 2017). A summary of the results from this report is presented below:

- Sugar Creek A: No harvestable peat was documented
- Sugar Creek B: 68 ha of harvestable peat resource with an average total peat depth of 1.73 m and an average harvestable peat depth of 1.25 m
- Sugar Creek C: 237 ha of harvestable peat resource with an average total peat depth of 2.55 m and an average harvestable peat depth of 2.11 m
- Sugar Creek D: 248 ha of harvestable peat resource with an average total peat depth of 2.93 m and an average harvestable peat depth of 2.25 m
- Sugar Creek E: 47 ha of harvestable peat resource with an average total peat depth of 2.45 m and an average harvestable peat depth of 1.70 m

7.0 Sensitive Sites and Species Protocols

7.1 Heritage and Cultural Resources

In the event that heritage resources are discovered during the development or operation of South Washow, work in the area will be stopped and the Historic Resources Branch will be notified.

7.1.1 Ramsay Point

Prior to development, the Manitoba Historic Resources Branch indicated a low potential of heritage resources in Ramsay Point (Kontzamanis, Graumann, Smith MacMillan Inc., 2010). A second screening was conducted in May 2018 to review Ramsay Point with amendments. The Manitoba Historic Resources Branch did not identify any areas of concern within Ramsay Point or the amendments (Appendix D).

7.1.2 Sugar Creek

A screening request was submitted to the Manitoba Historic Resources Branch in May 2018. No areas of concern were identified within Sugar Creek A, B, C, D or E (Appendix D). Additional information regarding heritage and cultural resources will be addressed in the EAP for Sugar Creek and updates will be made to the PMP as required.

7.2 Species At Risk

In the event that sensitive plant or wildlife species are discovered during the development or exploration of South Washow, work in the area will stop and the Manitoba Conservation Data Centre (MCDC) will be notified. Disturbance of sensitive species habitats will be avoided by imposing a setback distance for wildlife and transplanting plants to a similarly suited location, if possible.

7.2.1 Ramsay Point

Rare plant surveys were conducted as a part of the Ramsay Point EAL in 2010, prior to disturbance, and found six occurrences of the provincially rare (S2) orchid grass-pink (*Calopogon tuberosus*). Workers were made aware of the orchids and the areas in which they were observed was not developed. The MCDC had no records of any rare or endangered plant species within Ramsey Point (Kontzamanis, Graumann, Smith MacMillan Inc., 2010).

A search of the Manitoba Conservation Data Centre's rare species database was conducted in May 2018. Results from the inquiry are attached in Appendix E. No plant or wildlife species listed under the *Manitoba Endangered Species and Ecosystem Act* (ESEA), the *Species at Risk Act* (SARA) or the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) were found to occur within South Washow.

7.2.2 Sugar Creek

A search of the MCDC rare species database was conducted in May 2018. No plant or wildlife species listed under ESEA, SARA or COSEWIC were found to occur within Sugar Creek (Appendix E). Additional information regarding species at risk will be collected as part of the EAP process for Sugar Creek and updates will be made to the PMP as required.

8.0 References

- Bannatyne, B.B. (1980). *Sphagnum Bogs In Southern Manitoba And Their Identification By Remote Sensing*. Manitoba Department of Energy and Mines: Economic Geology Report ER79-7. 103 pp.
- Canadian Sphagnum Peat Moss Association. (2015). *2015 Statistics about Peatland Areas Managed for Horticultural Peat Harvesting in Canada*. Retrieved from http://tourbehorticole.com/wp-content/uploads/2016/11/Summary_2015_Industry_Statistic_web.pdf on April 25, 2018.
- FP Innovations. (2016). *Resource Roads and Wetlands – Opportunities to Maintain Hydrologic Function*. Internal Report IR-2010-11-01. Retrieved online at https://fpinnovations.ca/ResearchProgram/SiteAssets/Pages/research-program-forest-operations/FPInnovations_IR-2010-11-01-_ResourceRoads_BorealForestWetlands.pdf on June 8, 2018.
- Government of Manitoba. (2015a). *The Peatlands Stewardship and Related Amendments Act*. Retrieved online from <https://web2.gov.mb.ca/bills/40-3/pdf/b061.pdf> on April 30, 2018.
- Government of Manitoba. (2015b). *The Wildfires Act*. Retrieved online from http://web2.gov.mb.ca/laws/statutes/ccsm/_pdf.php?cap=w128 on May 16, 2018.
- Government of Manitoba. (2018). *Forest Use and Management Regulation*. Retrieved online at https://web2.gov.mb.ca/laws/regs/current/_pdf-regs.php?reg=227/88%20R on May 25, 2018.
- Kontzamanis, Graumann, Smith MacMillan Inc. (2010). *Ramsay Point Peat Mine Development – Manitoba Environment Act Proposal*. 251 pp.
- Manitoba Conservation and Water Stewardship. (2012). *Forestry Road Management*. Manitoba Conservation and Water Stewardship Forest Practices Guidebook. Retrieved online from https://www.gov.mb.ca/sd/forestry/pdf/practices/forestry_road_mgmt_2012.pdf on May 3, 2018.
- Manitoba Conservation and Water Stewardship. (2015). *Manitoba Land Initiative – Gross Watersheds*. Retrieved online at http://mli2.gov.mb.ca/water_resources/gross_watershed_index.html on May 23, 2018.
- Manitoba Sustainable Development. (2017a). *Manitoba’s Submission Guidelines for Peatland Management Plans – Peatland Management Guidebook*. Forestry and Peatlands Branch, Manitoba Sustainable Development. 6 pp.
- Manitoba Sustainable Development. (2017b). *Peat Harvest Licence Bulk Peat Calculation Guide*. Retrieved from https://www.gov.mb.ca/sd/forestry/peatland/doc/bulk_peat_calculation_guide.xlsx on May 11, 2018.
- Quinty, E and L. Rochefort. (2003). *Peatland Restoration Guide, Second Edition*. Université Laval. Ste-Foy, Quebec. 21 pp. Accessed online at http://www.gret-perg.ulaval.ca/uploads/tx_centrecherche/Peatland_Restoration_guide_2ndEd.pdf on February 16, 2018.

- Smith, R.E., H. Veldhuis, G.F. Mills, R.G. Eilers, W.R. Fraser and G.W. Lelyk. (1998). *Terrestrial Ecozones, Ecoregions, and Ecodistricts, An Ecological Stratification of Manitoba's Landscapes*. Technical Bulletin 98-9E. Land Resource Unit, Brandon Research Centre, Research Branch, Agriculture and Agri-Food Canada, Winnipeg, Manitoba.
- Sun Gro Horticulture Canada Ltd. (2012). *Von Post Data Table*. Unpublished raw data.
- Sun Gro Horticulture Canada Ltd. (2017a). *Safety Procedures Manual: #25 Accidental Spill Response*. Original issue: April 2005. 2 pp.
- Sun Gro Horticulture Canada Ltd. (2017b). *Bog Husbandry Manual: Weed Control Procedure*. Original issue: May 2000. 3 pp.
- Sun Gro Horticulture Canada Ltd. (2018a). *Safety Procedures Manual: #1 Bog Emergency Response and Evacuation – Including Medical Emergency*. Original issue: June 3, 1992. 2 pp.
- Sun Gro Horticulture Canada Ltd. (2018b). *Safety Procedures Manual: #3 Emergency Evacuation (Fire, Dust, Explosion, Natural Disaster and Bomb Threats, Workplace Violence)*. Original issue: May 1993. 7 pp.
- Tarnocai, C., I.M. Kettles and B. Lacelle. (2011). *Peatlands of Canada*. Geological Survey of Canada. Open File 6561 (digital database).
- Vertex Professional Services Ltd. (2017). *2017 Peat Exploration Assessment – Sugar Creek Peat Harvest Licence*. Prepared for Sun Gro Horticulture Ltd. 80 pp.

FIGURES

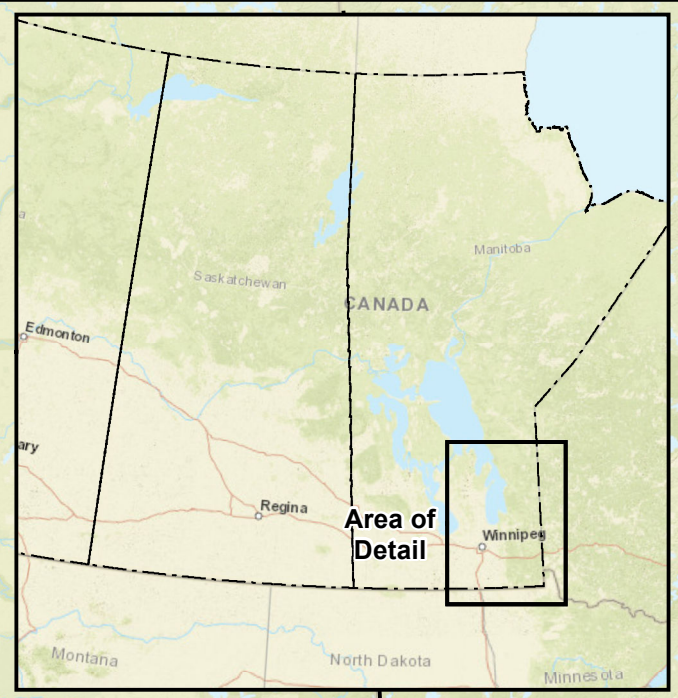


Dauphin River

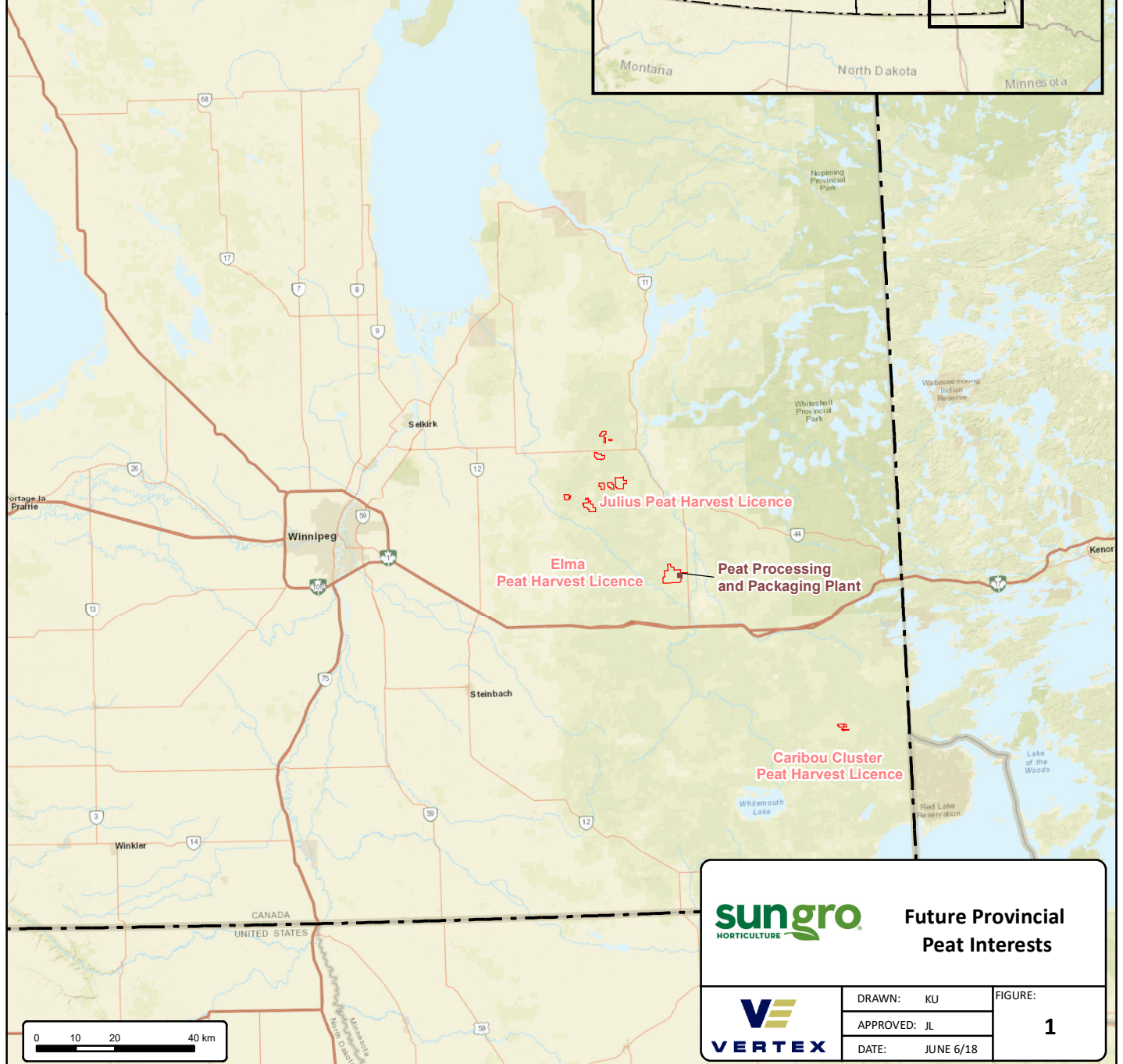
Kinnow Bay Peat Harvest Licence

North Washow Peat Harvest Licence

South Washow Peat Harvest Licence



Area of Detail

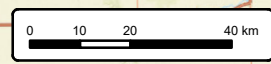




Julius Peat Harvest Licence

Elma Peat Harvest Licence

Peat Processing and Packaging Plant

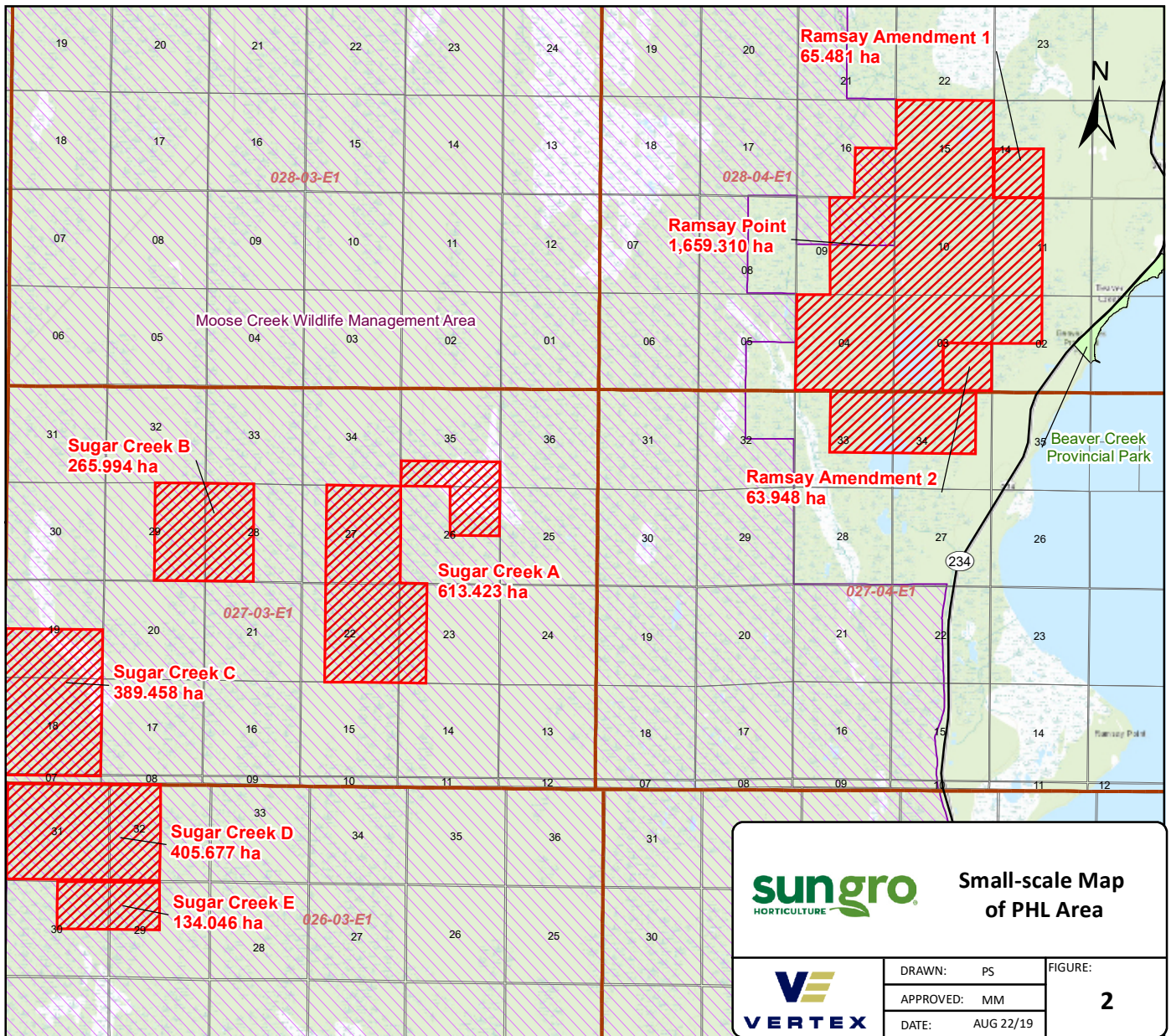
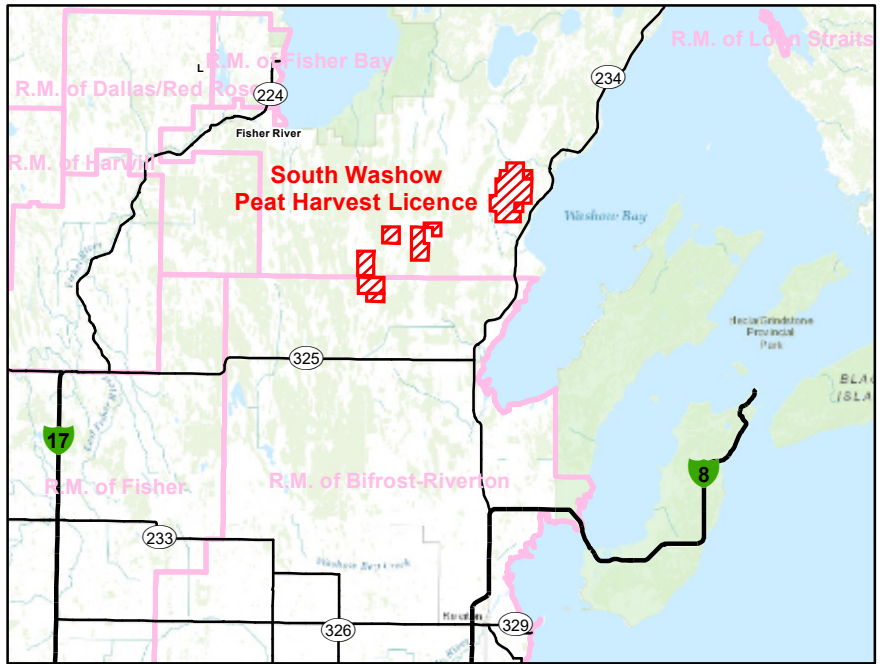
Caribou Cluster Peat Harvest Licence




	Future Provincial Peat Interests	
	DRAWN: KU	FIGURE: 1
	APPROVED: JL	
	DATE: JUNE 6/18	

VERSATILITY. EXPERTISE.

Document Path: G:\1-Projects\Sun Gro Horticulture\WXD\18N-01649 (Manitoba PHUs)\Elma\Figure 1 Future Provincial Peat Interests.mxd

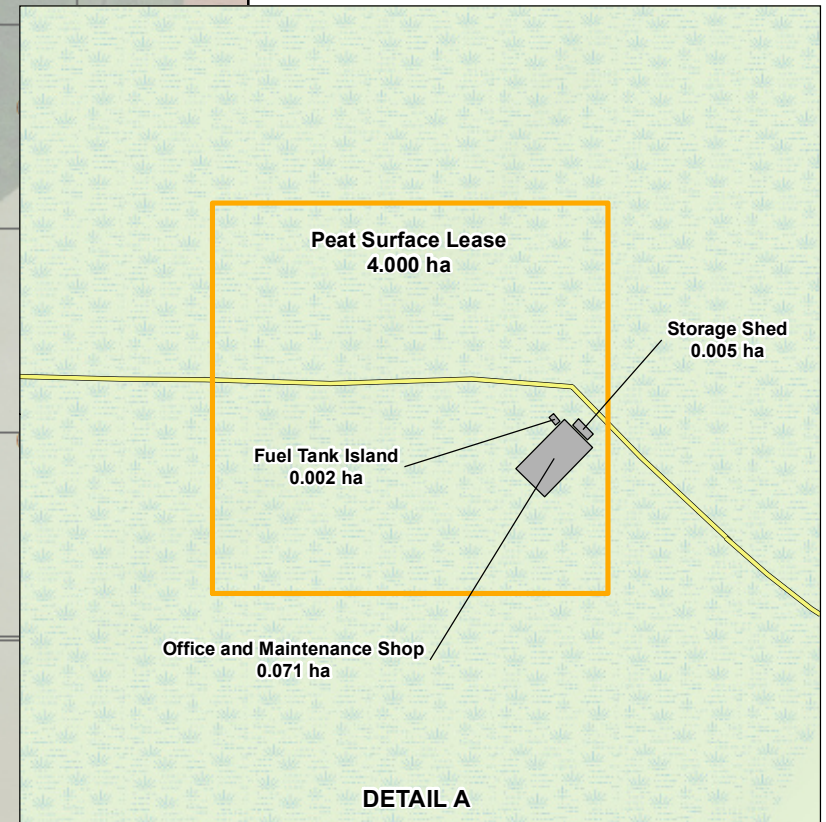
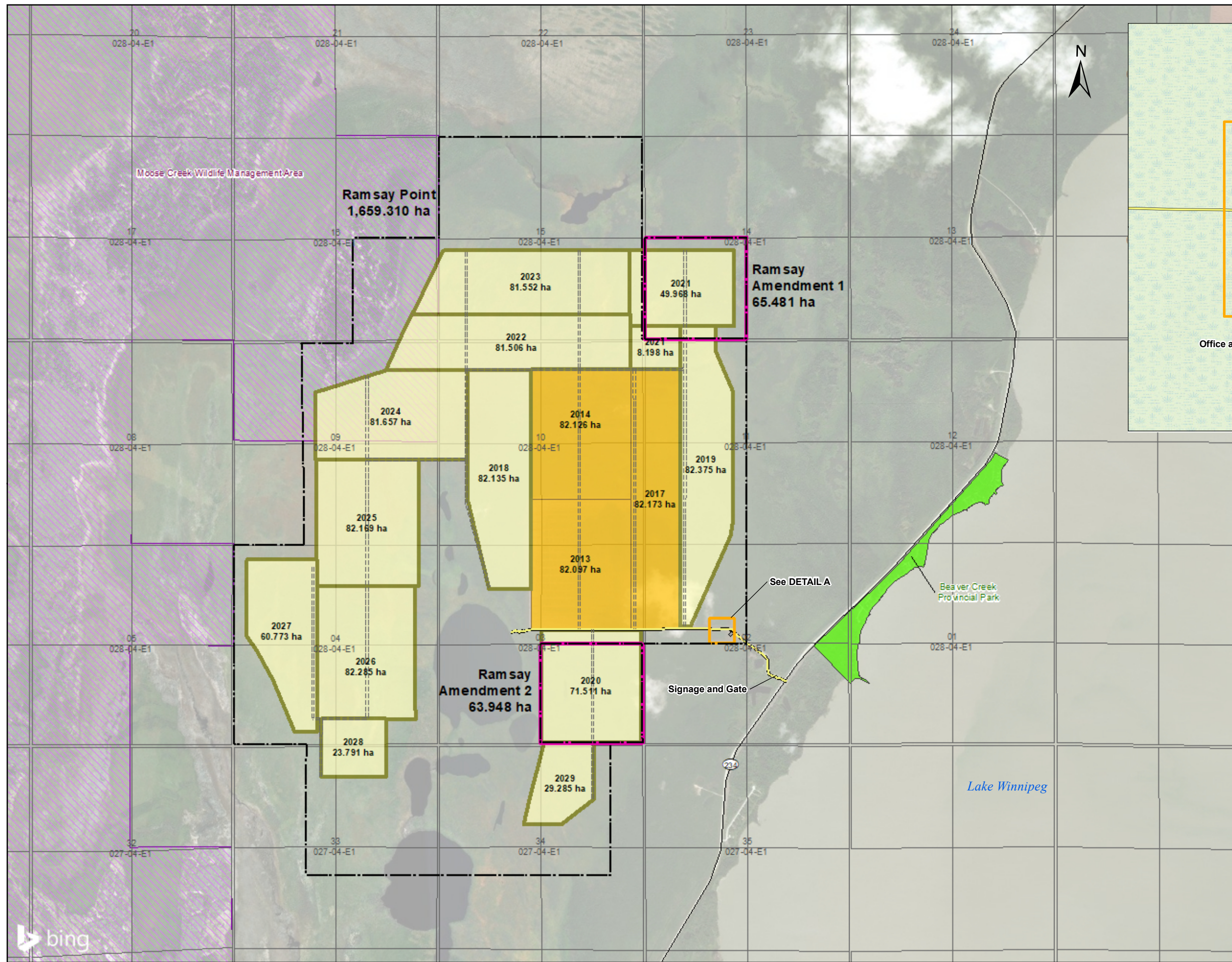




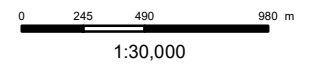
**Small-scale Map
of PHL Area**

	DRAWN: PS	FIGURE: 2
	APPROVED: MM	
	DATE: AUG 22/19	

Document Path: G:\1-Projects\Sun Gro Horticulture\XDS\2018\18N-01649 (Manitoba PMPs)\South Washow\Figure 3a Large-Scale Map Ramsay.mxd



- Legend**
- Peat Harvest Licence
 - Peat Harvest Licence Amendment
 - Active Harvest Area
 - Proposed Harvest Area
 - Peat Surface Lease
 - Facility
 - Provincial Park
 - Moose Creek Wildlife Management Area
 - Access Road
 - Haul Road





Notes: Aerial Image from Bing, 2014

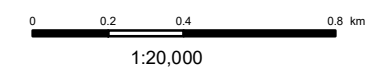
	Large-scale Map Ramsay Point				
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APPROVED: MM					
DATE: AUG 23/19					





Document Path: G:\1-Projects\Sun Gro Horticulture\XDs\2018\18N-D\1649 (Manitoba PMPs)\South Washow\Figure 3b Large-Scale Map Sugar Creek A and B.mxd



- Legend**
-  Peat Harvest Licence
 -  Moose Creek Wildlife Management Area



Notes: Aerial Image from Bing, 2014

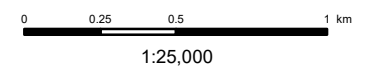
	Large-scale Map Sugar Creek A and B	
	DRAWN: PS	FIGURE:
	APPROVED: MM	3b
	DATE: AUG 23/19	






Legend

-  Peat Harvest Licence
-  Proposed Peat Surface Lease
-  Planned Harvest Area
-  Facility
-  Moose Creek Wildlife Management Area
-  Priority Access Road
-  Alternate Access Road
-  Haul Road

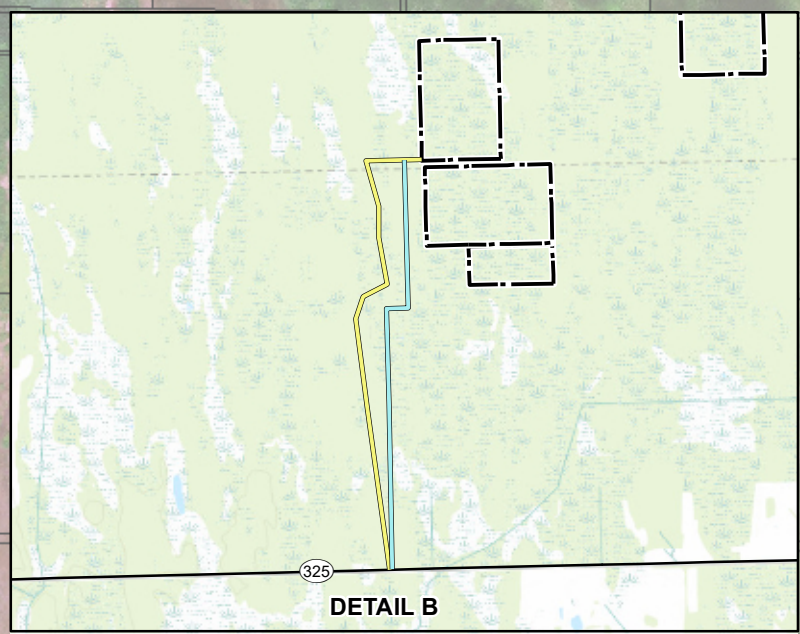
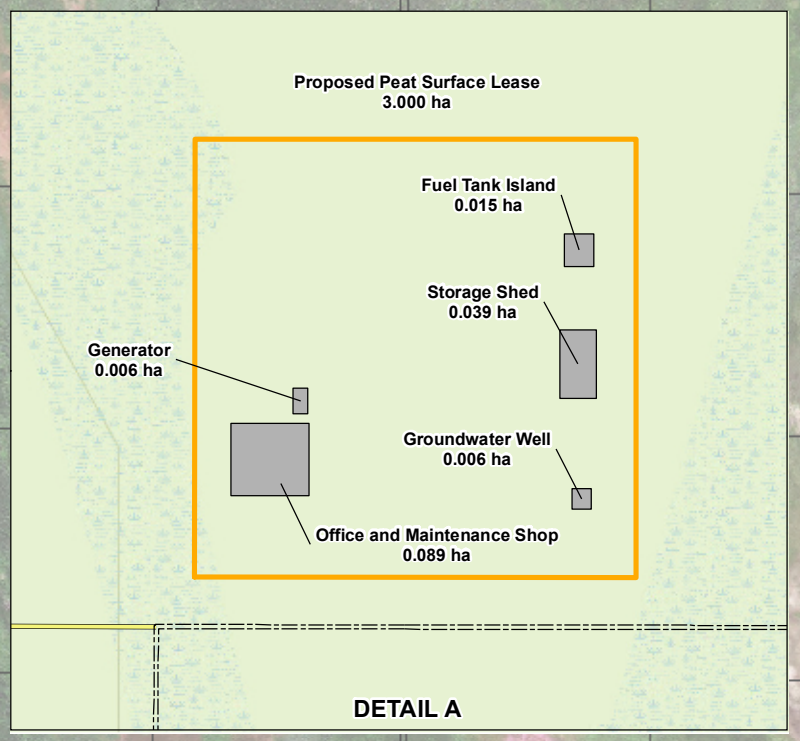
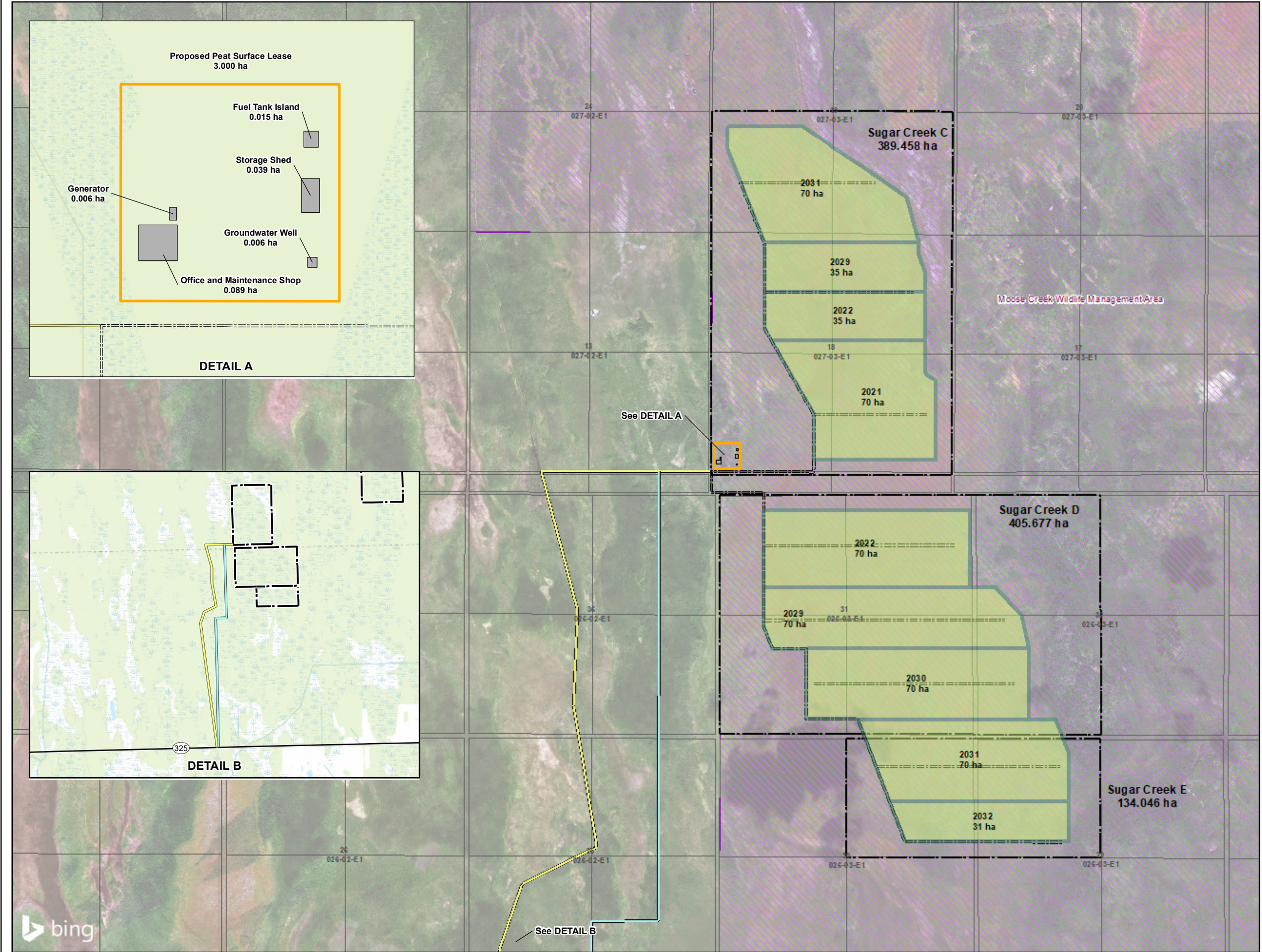


Notes: Aerial Image from Bing, 2014

sungro Large-scale Map
HORTICULTURE Sugar Creek C, D and E

	DRAWN: PS	FIGURE: 3c
	APPROVED: MM	
	DATE: AUG 23/19	

VERSATILITY. EXPERTISE.



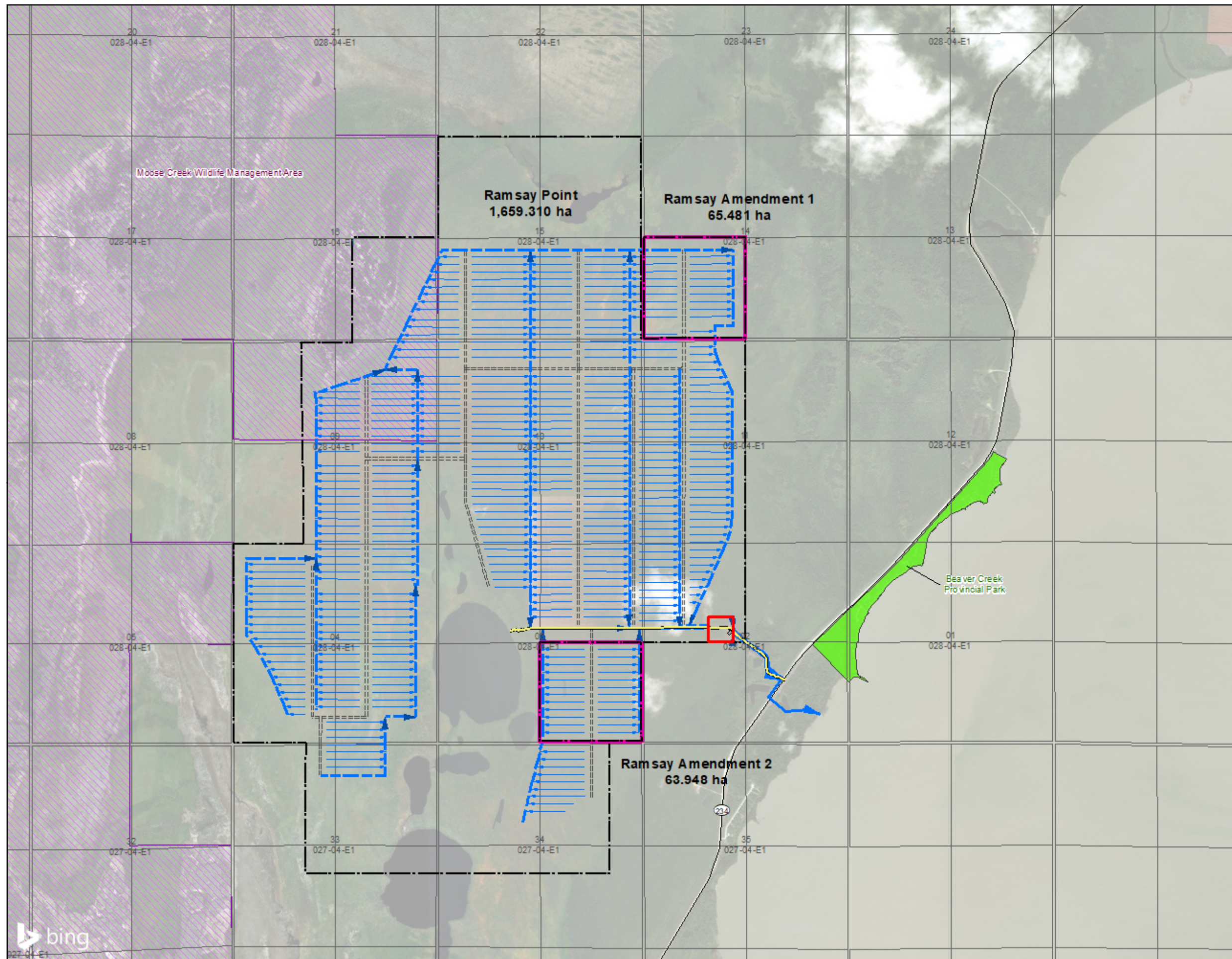
See DETAIL A

See DETAIL B

Document Path: G:\1-Projects\Sun Gro Horticulture\XDs\2018\18N-01649 (Manitoba PMPs)\South Washew\Figure 3c Large-Scale Map Sugar Creek C, D, E.mxd

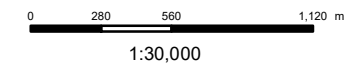


Document Path: G:\1-Projects\Sun Gro Horticulture\XDS\2018\1818N-01649 (Manitoba PMPs)\South Washew\Figure 4a Drainage Works Ramsay.mxd



Legend

- Peat Harvest Licence
- Peat Harvest Licence Amendment
- Facilities
- Laydown Area
- Sedimentation Pond
- Moose Creek Wildlife Management Area
- Provincial Park
- Lateral Ditch
- Perimeter Ditch
- Outlet Ditch
- Haul Road



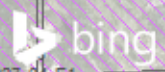
Notes: Aerial Image from Bing, 2014



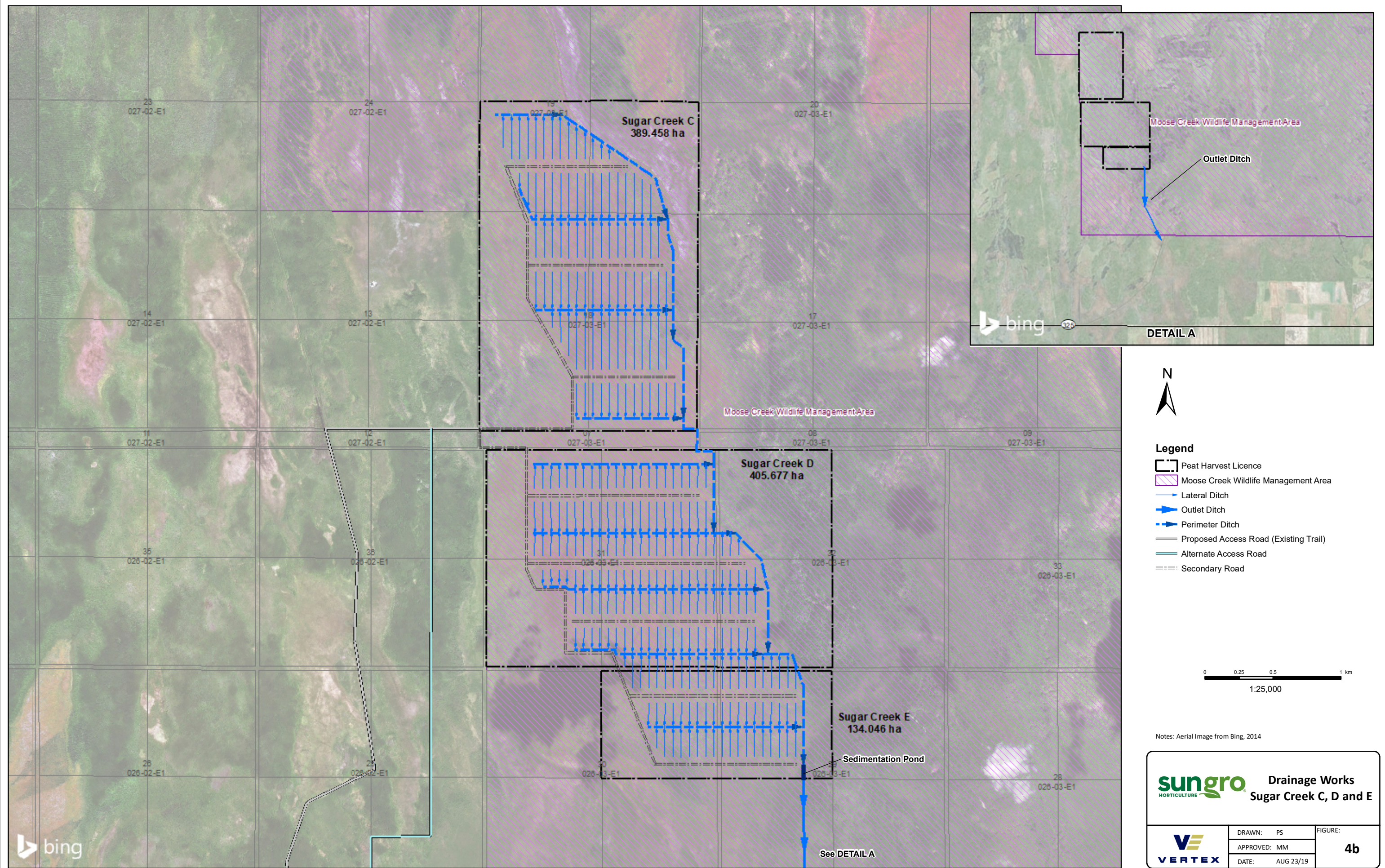
**Drainage Works
Ramsay Point**



DRAWN: PS	FIGURE: 4a
APPROVED: MM	
DATE: AUG 23/19	

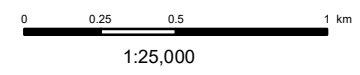


Document Path: G:\1-Projects\Sun Gro Horticulture\XDs\2018\18118N-01649 (Manitoba PMPs)\South Washaw\Figure 4b Drainage Works Sugar Creek C D E.mxd



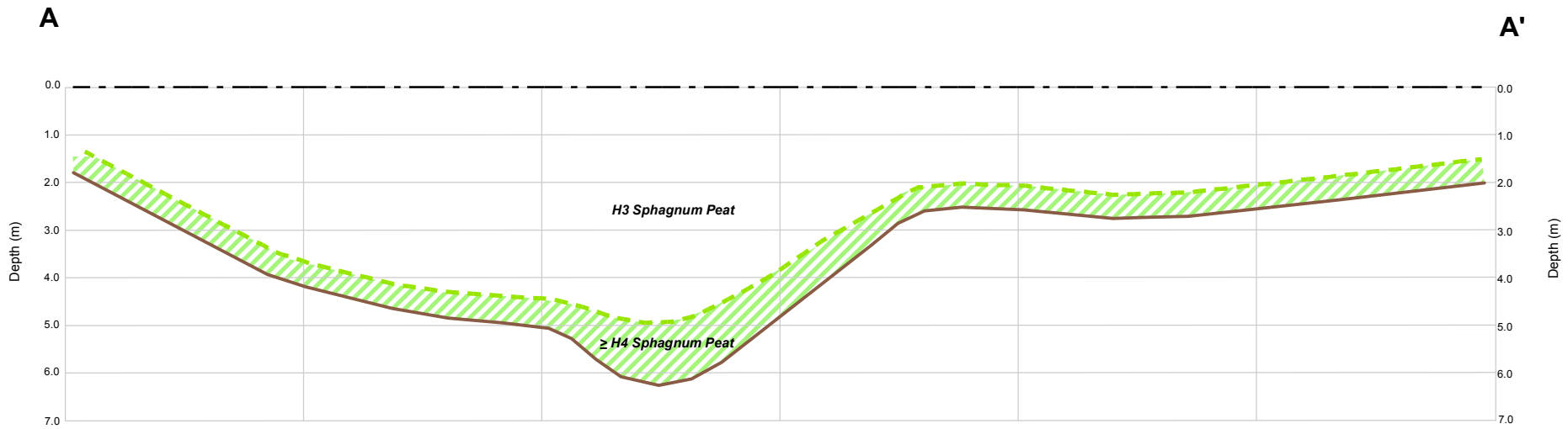
Legend

- Peat Harvest Licence
- Moose Creek Wildlife Management Area
- Lateral Ditch
- Outlet Ditch
- Perimeter Ditch
- Proposed Access Road (Existing Trail)
- Alternate Access Road
- Secondary Road





Notes: Aerial Image from Bing, 2014

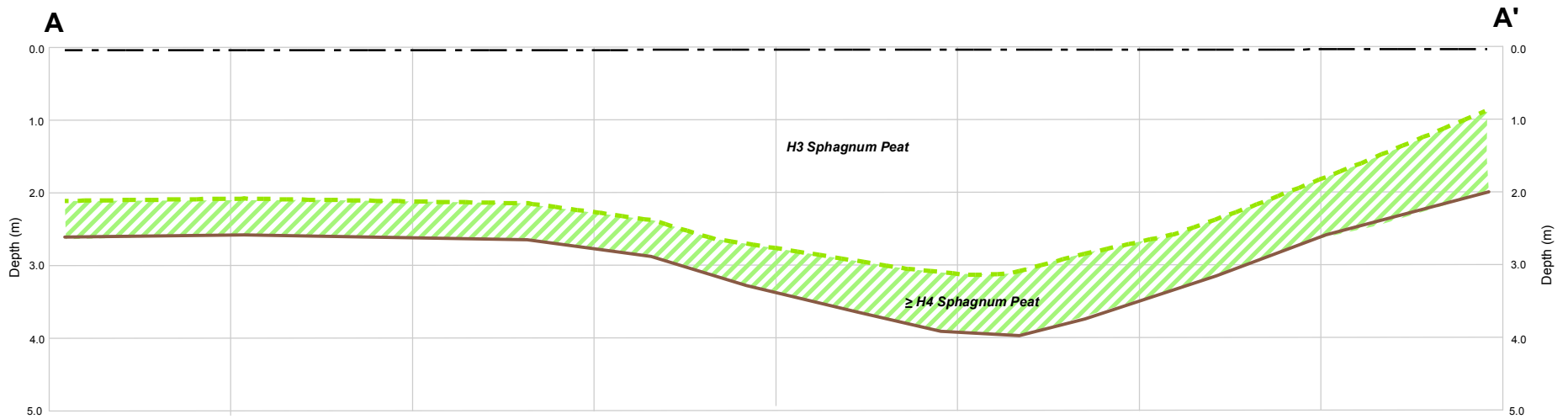
	Drainage Works	
	Sugar Creek C, D and E	
	DRAWN: PS	FIGURE:
	APPROVED: MM	4b
	DATE: AUG 23/19	



Legend

- - Estimated Original Peat Surface
- - Proposed Average Residual Peat Surface
- Estimated Mineral Soil
- Residual Peat

 Pre-harvest and Proposed Residual Peat Depths Ramsay Point		
	DRAWN: PS	FIGURE: 5a
	APPROVED: JL	
	DATE: JUN 15/18	



Legend

- - Estimated Original Peat Surface
- - Proposed Average Residual Peat Surface
- Estimated Mineral Soil
- Residual Peat

	Pre-harvest and Proposed Residual Peat Depths Sugar Creek C, D and E	
	DRAWN: PS	FIGURE:
	APPROVED: JL	5b
	DATE: JUN 15/18	

TABLES

Table 1. Previously Issued and Future Required Licences and Permits
Sun Gro Horticulture Canada Ltd.
Peat Harvest Licence No. 4 - South Washow
Project #: 18N-01649

Sub-area	Licence or Permit	Issuing Authority	Date of Approval	Application Timeline
Ramsay Point Sugar Creek A, B, C, D and E	Peat Harvest Licence No. 4 ¹	Forest and Peatlands Management Branch of Manitoba Conservation and Water Stewardship	June 15, 2015	-
Ramsay Point	Environment Act Licence 2964 ER	Environment Approvals Branch	February 13, 2013	-
Ramsay Point	Forest Damage Appraisal 15169	Forestry Branch	March 10, 2014	-
Ramsay Point	General Permit GP66118	Crown Lands	January 1, 2018	-
Ramsay Point	Licence to Construct Water Control Works 13-WCW-0341	Manitoba Conservation and Water Stewardship	March 25, 2013	-
Ramsay Point	Peat Surface Lease	Crown Lands	March 21, 2016	-
Ramsay Point	Timber Appraisal (Phase 3)	Manitoba Conservation and Water Stewardship	December 15, 2015	-
Ramsay Point	Timber Appraisal (Phase 4)	Sustainable Development	February 28, 2018	-
Sugar Creek C, D, E	Environment Act Licence	Environmental Approvals Branch	-	December 2019
Sugar Creek C, D, E	Forest Damage Appraisal	Forestry Branch	-	July 2020
Sugar Creek C, D, E	General Permit	Government of Manitoba	-	July 2020
Sugar Creek C, D, E	Licence to Construct Water Control Works	Water Stewardship	-	July 2020
Sugar Creek C, D, E	Peat Surface Lease	Crown Lands	-	July 2020
Sugar Creek C, D, E	Timber Appraisal	Regional/District Office (Regional forester)	-	July 2020
Sugar Creek C, D, E	Work Permit	Regional/District Office	-	July 2020

¹Transferred from Quarry Lease following enactment of *The Peatlands Stewardship and Related Amendments Act*

Table 2. Harvesting Timeline
 Sun Gro Horticulture Canada Ltd.
 Peat Harvest Licence No. 4 - South Washow
 Project #: 18N-01649

Sub-area	Year									
	2011 to 2020		2021 to 2030		2031 to 2040		2041 to 2050		2051 to 2060	
Ramsay Point										
Sugar Creek A										
Sugar Creek B										
Sugar Creek C										
Sugar Creek D										
Sugar Creek E										

Table 3. Estimated Annual Harvest Areas, Bulk Peat Volumes and Royalties
Sun Gro Horticulture Canada Ltd.
Peat Harvest Licence No. 4 - South Washow
Project #: 18N-01649

	Year															
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Ramsay Point																
Prepared Area (ha) ¹	165	0	80	85	80	70	60	80	85	80	85	80	60	25	30	0
Harvest Area (ha) ¹	165	165	245	245	330	410	480	540	620	705	785	870	1010	1035	1065	1065
Bulk Peat (m ³) ²	40,000	90,000	120,000	100,000	130,000	160,000	190,000	220,000	250,000	280,000	310,000	350,000	400,000	410,000	430,000	430,000
Royalties (\$)	4,800.00	10,800.00	14,400.00	12,000.00	15,600.00	19,200.00	22,800.00	26,400.00	30,000.00	33,600.00	37,200.00	42,000.00	48,000.00	49,200.00	51,600.00	51,600.00
Sugar Creek A																
Prepared Area (ha) ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Harvest Area (ha) ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulk Peat (m ³) ²	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Royalties (\$)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sugar Creek B																
Prepared Area (ha) ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Harvest Area (ha) ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulk Peat (m ³) ²	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Royalties (\$)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sugar Creek C																
Prepared Area (ha) ¹	-	-	-	-	-	-	70	35	0	0	0	0	0	0	0	35
Harvest Area (ha) ¹	-	-	-	-	-	-	70	105	105	105	105	105	105	105	105	140
Bulk Peat (m ³) ²	-	-	-	-	-	-	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	60,000
Royalties (\$)	-	-	-	-	-	-	4,800.00	4,800.00	4,800.00	4,800.00	4,800.00	4,800.00	4,800.00	4,800.00	4,800.00	7,200.00
Sugar Creek D																
Prepared Area (ha) ¹	-	-	-	-	-	-	-	70	0	0	0	70	0	0	0	0
Harvest Area (ha) ¹	-	-	-	-	-	-	-	70	70	70	70	140	140	140	140	140
Bulk Peat (m ³) ²	-	-	-	-	-	-	-	30,000	30,000	30,000	30,000	30,000	30,000	30,000	60,000	80,000
Royalties (\$)	-	-	-	-	-	-	-	3,600.00	3,600.00	3,600.00	3,600.00	3,600.00	3,600.00	3,600.00	7,200.00	9,600.00
Sugar Creek E																
Prepared Area (ha) ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Harvest Area (ha) ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulk Peat (m ³) ²	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Royalties (\$)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

¹Numbers are rounded to the nearest 5 ha

²Past numbers are rounded and may not reflect exact values reported; future numbers are estimated based on data from 2015 to 2017 and are rounded to the nearest 10,000 m³

Note: Estimates are for the term of the current PHL. Estimates will be reported for subsequent years and active sub-areas upon renewal of the PHL

APPENDIX A

Licence No. / Licence n°: 4

Issue Date / Date de délivrance : June 15, 2015

REVISED/REVISE :

REVISED/REVISE :

Issued to:

SUN GRO HORTICULTURE CANADA LTD.

Issued for:

All those portions of sections 09-28-04, 10-28-04, 11-28-04, 02-28-04, 03-28-04, 04-28-04, 15-28-04, 16-28-04, 34-27-04, 33-27-04, 31-26-03, 30-26-03, 32-26-03, 29-26-03, 18-27-03, 19-27-03, 26-27-03, 28-27-03, 29-27-03, 27-27-03, 35-27-03, 23-27-03 and 22-27-03 EPM as shown on the map attached as Schedule "A" to this Licence;

(collectively the "Licence Area").

Licence term:

This Licence is valid until December 31, 2030

This Licence is issued in accordance with and subject to The Peatlands Stewardship Act, its regulations, both as may be amended from time to time, and the terms and conditions set out in this Licence.

<Original signed by>

DIRECTOR
THE PEATLANDS STEWARDSHIP ACT

DEFINITIONS

In this Licence,

“Active Area” means the area(s) within a Licence Area that are experiencing activities related to the peat harvesting process, such as, but not limited to, clearing of brush or trees, ditching, or the removal of materials. Also, an Active Area requires an Environment Act Licence and triggers the requirements for the restoration security under the Regulation;

“Crown” means Her Majesty the Queen in right of the Province of Manitoba, as represented by the Forest and Peatlands Management Branch of Manitoba Conservation and Water Stewardship, or such successor branch or agency of the Government of Manitoba;

“Crown Peat Return” means the statutory declaration required by the Regulation, as amended from time to time;

“Director” means the person appointed as the director of peatlands stewardship under The Peatlands Stewardship Act, or such successor to that person;

“The Peatlands Stewardship Act” or the **“Act”** means The Peatlands Stewardship Act (C.C.S.M., c. P31), as amended from time to time; and

“Regulation” means the Peatlands Stewardship Regulation (M.R. 82/2015), as amended from time to time.

AUTHORIZATION

1. Subject to the terms and conditions of this Licence, the Licencee is authorized to engage in peat harvesting by removing peat from Crown peatland within the Licence Area for commercial purposes, including any activity undertaken on or in respect of the Licence Area to facilitate the removal of peat from the Licence Area, continued vertically downward.
2. Thirty (30) days prior to making an area within the Licence Area active (Active Area), the Licencee shall notify the Director of its plan and provide the security required under clause 9 of this Licence.

PLANNING

i. PEATLAND MANAGEMENT PLAN

3. The Licencee shall submit to the Director a peatland management plan in accordance with the Act. The Licencee shall manage the Licence Area in accordance with the approved management plan.

ii. PEATLAND RECOVERY PLAN

4. The Licencee shall submit to the Director a peatland recovery plan in accordance with the Act. The Licencee must ensure that the activities set out in the approved peatland recovery plan are undertaken in the Licence Area and completed at the time set out in the plan.
5. Until the peatland recovery plan is approved by the Director, the Licencee shall comply with the Environment Act Licence requirements respecting the mine closure plan it prepared under the *Mine Closure Regulation 67/99*.
6. Any alteration of a peatland management plan or peatland recovery plan is subject to submission to the Director or a proposed alteration to that plan and approval by the Director of that alteration.

FEES AND CHARGES

7. The Licencee shall pay to the Crown an annual land reservation charge in accordance with the Regulation.
8. The Licencee shall pay to Crown the prescribed royalty fee by March 1st each year in accordance with the Regulation.
9. In accordance with the Regulation, the Licencee shall provide to the Director the form of security approved by the Director before any activity under this Licence begins in any Active Area.

RECORDS AND REPORTING

10. The Licencee shall make, maintain and submit to the Crown such records as are required by the Act and Regulation.
11. The Licencee shall make, maintain and submit to the Crown such reports as are required by the Act and Regulation.

12. The Licencee shall submit to the Director a Crown Peat Return, setting out the information required by the Regulation.
13. The Licencee shall meet with the Director, or his or her representatives, in each year of the Licence term. The Licencee will present its annual reports and annual plan at the meeting. The annual meeting may be held concurrently with any meeting required under The Environment Act Licence.

LIABILITY

14. The Licencee shall indemnify and save harmless Her Majesty the Queen in Right of the Province of Manitoba, her Ministers, officers, agents and employees from and against any and all claims, liability and demands for or by reason of anything done or omitted to be done by the Licencee or its agents or employees with respect to the Licence Area.
15. This Licence shall in no way limit Manitoba Hydro's or the Government of Manitoba's right to raise or lower the water levels on any body of water which may affect the Licence Area and Manitoba Hydro or the Government of Manitoba shall not be held liable for changes in the water level. This Licence does not imply any guarantee of water levels at the Licence Area.

GENERAL TERMS AND CONDITIONS

16. This Licence may be suspended, cancelled or its renewal refused in accordance with the Act and the Regulation.
17. In addition to the rights under clause 16 of this Licence, the Director may cancel this Licence if the Licencee makes an assignment for the benefit of creditors, becomes bankrupt or insolvent, takes the benefit of, or becomes subject to, any statutes that may be in force relating to bankrupt or insolvent debtors (the appointment of a receiver or receiver and manager of the assets of the Licencee being conclusive evidence of insolvency), or if any certificate or order is made or granted for the winding-up or dissolution of the Licencee, voluntarily or otherwise.
18. This Licence does not provide any other authority that may be required under federal or provincial enactments that may apply to the Licence Area or the Licencee's activities. The Licencee shall obtain and comply with all other authorizations as may be necessary for its activities on the Licence Area, including, but not limited to, a Licence under The Environment Act.

We, the undersigned Licencee, or duly authorized representative of the Licencee, have read, in their entirety, the terms and conditions contained in this Licence. We understand the rights and responsibilities attached to this Licence, and we further understand that failure to comply with any Licence terms and conditions may result in the suspension or cancellation of the Licence, or any other enforcement actions as provided for in The Peatlands Stewardship Act.

THE LICENCEE

<Original signed by>

Per: _____

Title: _____

Per: _____

Title: _____

I/We have authority to bind the Licencee.

Schedule "A" Maps

Peat Harvest Licence No. 4

Company: SUN GRO HORTICULTURE CANADA LTD

Licence Group: South Washow

Sub Area: Ramsay Point

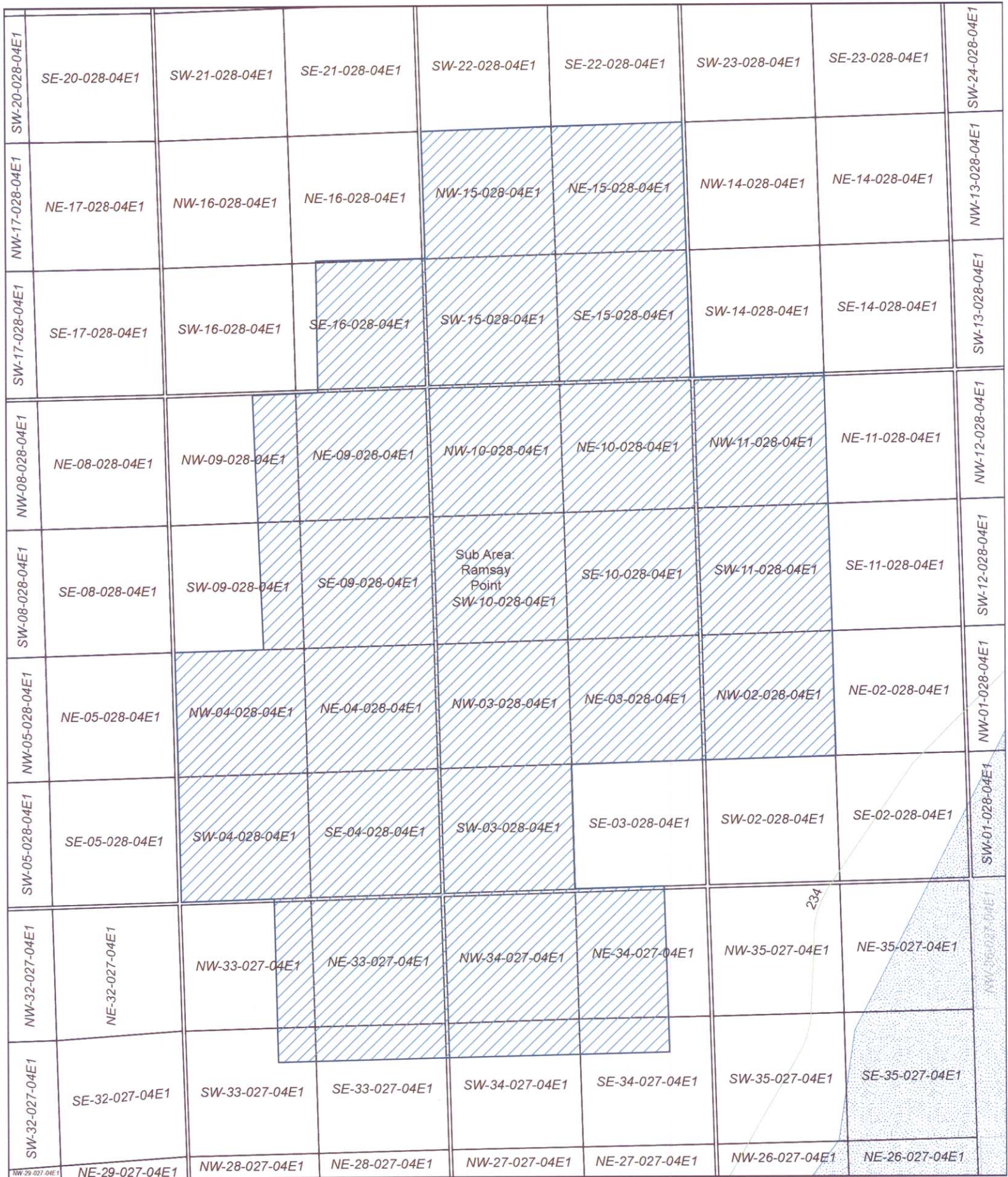
Sub Area: Sugar Creek A

Sub Area: Sugar Creek B

Sub Area: Sugar Creek C

Sub Area: Sugar Creek D

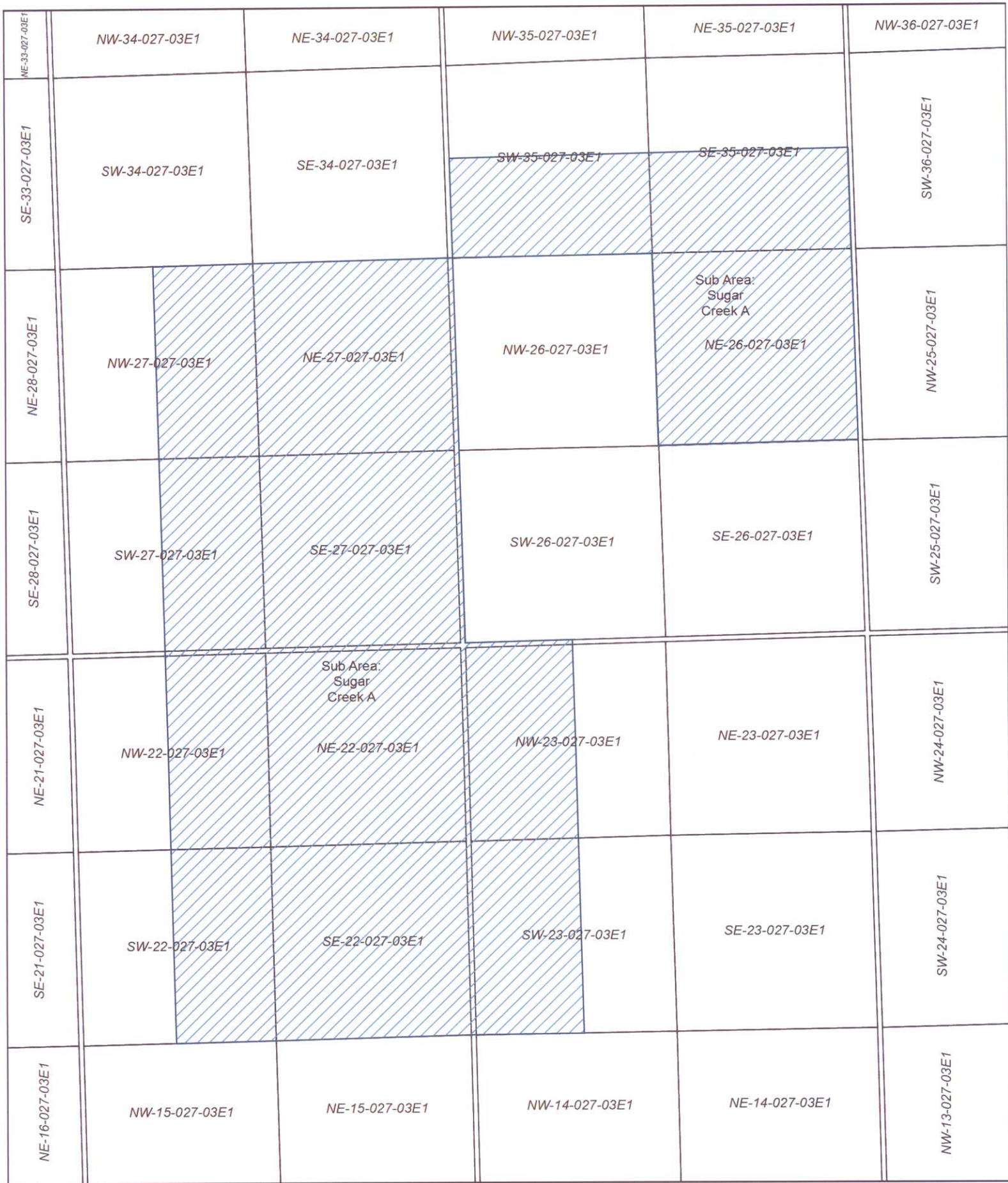
Sub Area: Sugar Creek E



Company: SUN GRO HORTICULTURE CANADA LTD.

Sub Area: Ramsay Point

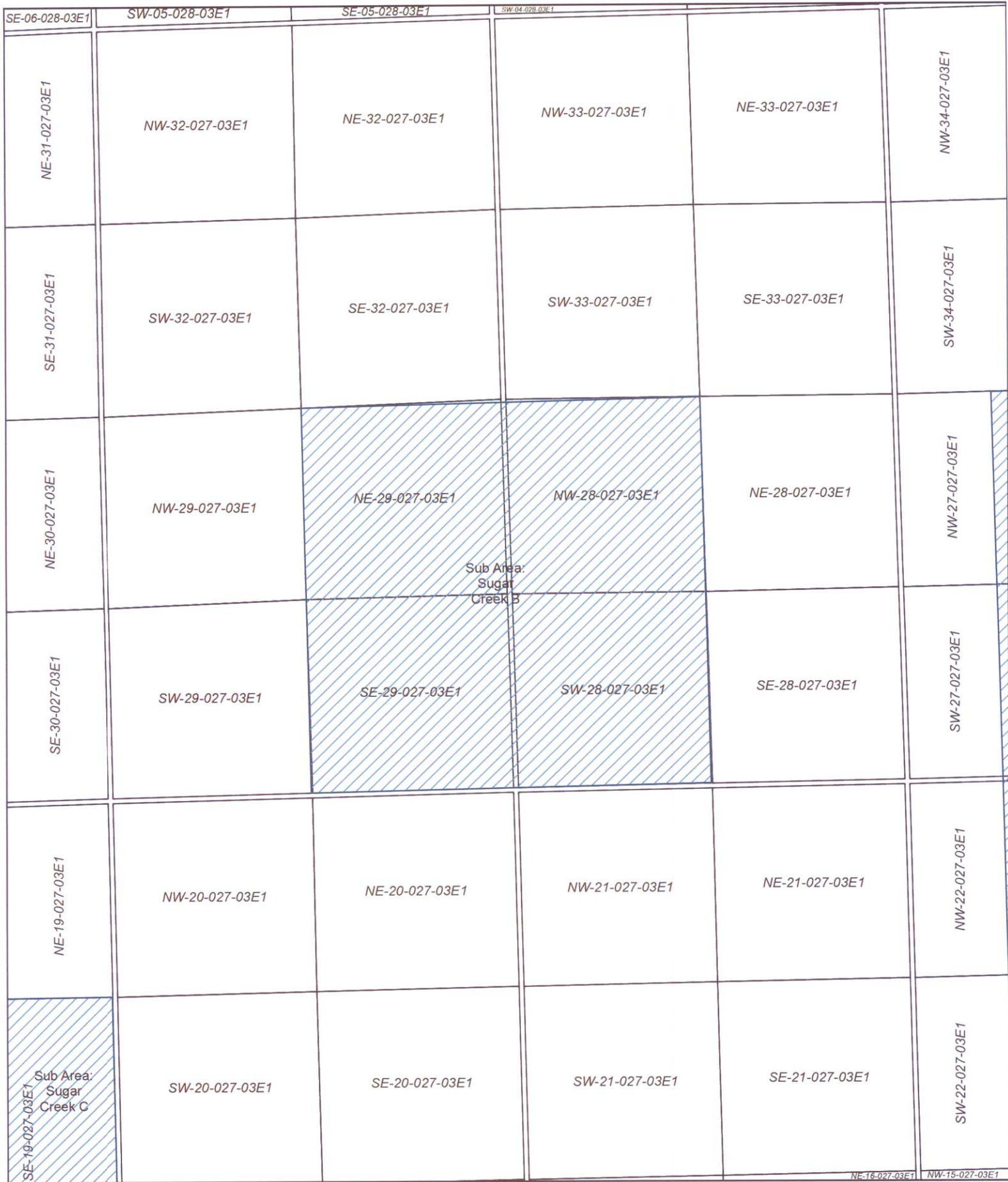




Company: SUN GRO HORTICULTURE CANADA LTD.

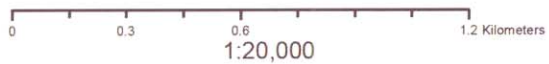
Sub Area: Sugar Creek A

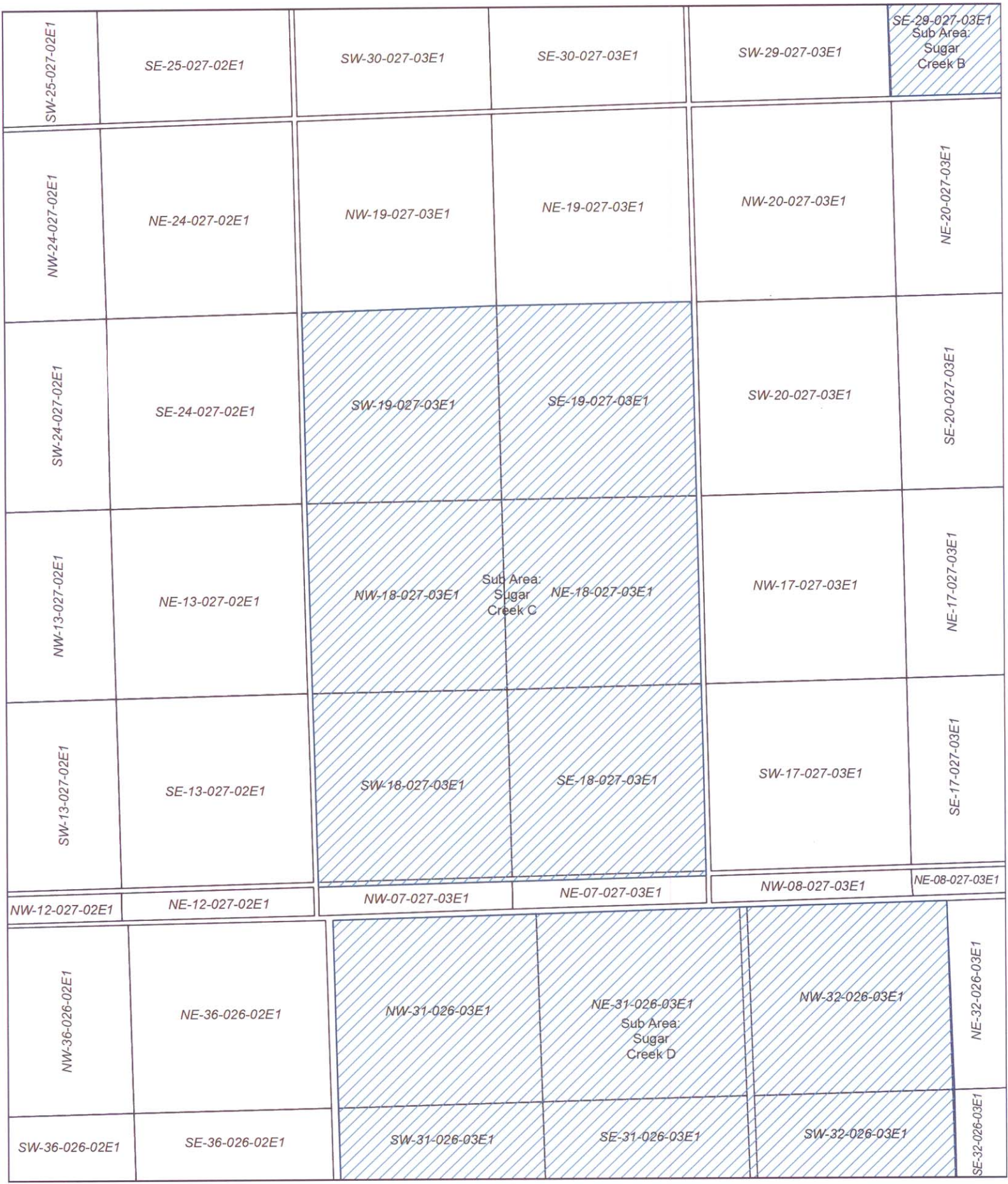




Company: SUN GRO HORTICULTURE CANADA LTD.

Sub Area: Sugar Creek B

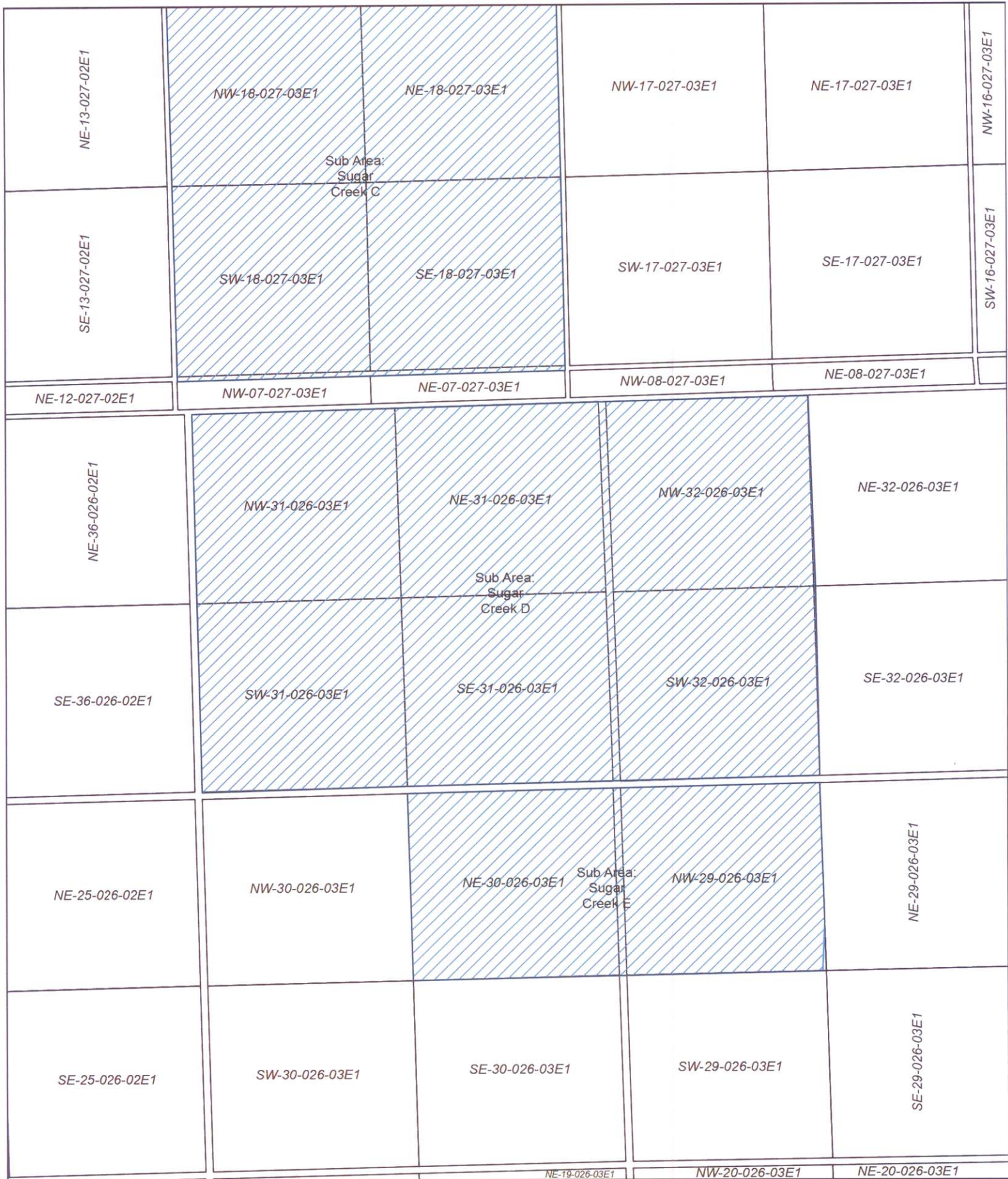




Company: SUN GRO HORTICULTURE CANADA LTD.

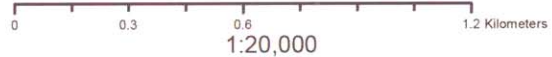
Sub Area: Sugar Creek C

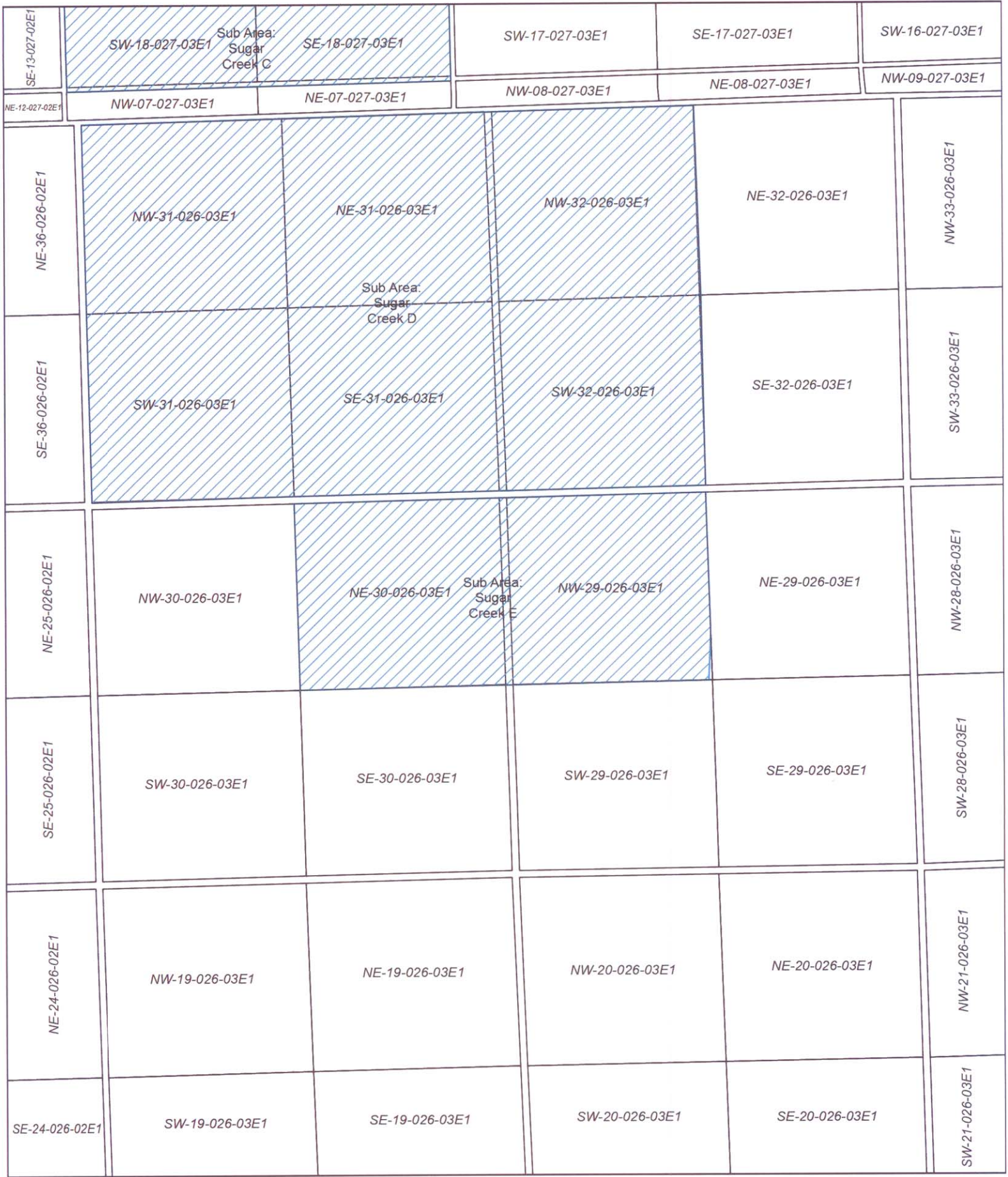




Company: SUN GRO HORTICULTURE CANADA LTD.

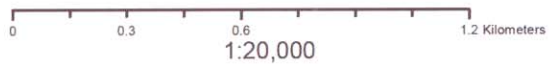
Sub Area: Sugar Creek D





Company: SUN GRO HORTICULTURE CANADA LTD.

Sub Area: Sugar Creek E



APPENDIX B

Appendix B. Effects, Monitoring and Mitigation Measures
Sun Gro Horticulture Canada Ltd.
All Manitoba PHLs
Project #: 18N-01649

Effect	Monitoring	Mitigation Measures
Water Quality		
Erosion of Peat and Sedimentation in Water	<p>Weekly water quality monitoring program testing for:</p> <ul style="list-style-type: none"> pH Total suspended solids <p>Three times per year (spring freshet, late-summer and autumn base-flow):</p> <ul style="list-style-type: none"> Nutrients: calcium, phosphorus, potassium, sodium, total Kjeldahl nitrogen, nitrate and nitrite-nitrogen, ammonia nitrogen, total organic carbon, sulphates (as Sulfur) Physio-chemical: pH, total alkalinity, electrical conductivity, total dissolved solids, total suspended solids, 5-day biological oxygen demand, hardness, turbidity, dissolved organic carbon Total and dissolved metals and metalloids: aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, cesium, magnesium, manganese, mercury (cold vapour), molybdenum, nickel, rubidium, selenium, silicon, silver, strontium, tellurium, thallium, thorium, tin, titanium, tungsten, uranium 	<ul style="list-style-type: none"> 150 m buffer area maintained around riparian areas of lakes, rivers, creeks streams and beaver habitat Slow-flowing perimeter and outlet ditches allow peat particles suspended in perimeter ditches to settle out of water before flowing out of the project area through ponding and low slopes Ditches are dredged as needed, generally annually, to ensure that there is a minimum depth of water entering the pond outlet and to prevent flooding. Ditch cleaning occurs during low flow periods (winter or late-summer) to minimize sedimentation in outflowing water Culverts with sliding gates are used to control flow in the event that flow rates exceed design criteria. Water is not released from a final discharge point if the pH is less than 5.0 or if total suspended solids is greater than 30 mg/L If water quality is impacted by pH, a limestone or carbonate-lined drainage ditch may be installed in perimeter or outlet ditches
Contaminant Spills	Regular inspections	<ul style="list-style-type: none"> Fuel is stored on a clay pad in the staging/laydown area in Underwriters Laboratories of Canada Inc. (ULC) Certified double-walled fuel storage containers with protective barrier Transportation of fuel, lubricants and other potentially hazardous materials adheres to all applicable provincial and federal regulations (<i>Manitoba Regulation 188/2001 regarding Storage and Handling of Petroleum Products and Allied Products</i>, the Office of the Fire Commissioner for the province of Manitoba and <i>The Dangerous Goods Handling and Transportation Act</i>) Appropriate waste disposal Spill containment supplies on-site Addressing immediately following Sun Gro protocol Emergency response: 24-hour emergency response line 204-944-4888 or toll-free at 1-855-944-4888
Air Quality		
Airborne Peat Particulate Matter	N/A	<ul style="list-style-type: none"> Roads are sprayed with water to suppress dust as needed Vacuum harvesters are equipped with adequate dust control equipment such as dust collectors and modifications to the exhaust system to direct airflow to the ground A buffer of undisturbed vegetation outside the perimeter ditch buffer has been left intact to act as a windbreak around peat fields Peat stockpiles are kept low and covered with tarps or snow fences if necessary Bulk peat transport trucks are covered with tarps Peat burning activities are not practiced at Sun Gro operations
Soils		
Compaction Under Roads and Staging Areas	N/A	<ul style="list-style-type: none"> Corduroy road base: road construction follows best management practices laid out in the <i>Resource Roads and Wetlands: A Guide for Planning, Construction and Maintenance</i> (FPInnovations, 2016) wherein cleared trees and roots are placed along road alignments (corduroy) and topped with clay and gravel
Contaminant Spills	N/A	• See above
Wildlife		
Habitat Loss and Fragmentation	Pre-construction habitat surveys	<ul style="list-style-type: none"> Revegetation (see Peatland Recovery Plan) Sensitive species and habitat avoidance and setbacks Wildlife safety on-site (Sun Gro Horticulture Inc., 2018a)
Changes in Water Quality	See water quality monitoring	• See water quality mitigation measures

Appendix B. Effects, Monitoring and Mitigation Measures
 Sun Gro Horticulture Canada Ltd.
 All Manitoba PHLs
 Project #: 18N-01649

Effect	Monitoring	Mitigation Measures
Vegetation		
Clearing and Removal of Plants	N/A	<ul style="list-style-type: none"> • Revegetation (see Peatland Recovery Plan)
Habitat Loss	N/A	<ul style="list-style-type: none"> • Revegetation (see Peatland Recovery Plan)
Colonization By Non-peatland, Non-native (Weed) Species	Regular inspections	<ul style="list-style-type: none"> • Sun Gro weed control procedure (Sun Gro Horticulture Canada Ltd., 2017a) • Cleaning all equipment prior to arrival onsite and after cultivation of weeded areas • Harrowing fields regularly to discourage establishment and growth of non-peatland species • Hand-picking in areas inaccessible to mobile equipment or for very small populations • Dark coloured barrier such as geotextile or shade cloth • Cleaning internal and perimeter ditches at minimum once per year, preferably by mid-July • Avoiding activity on areas with weeds or agronomic species until they are controlled • Utilizing materials that are weed or agronomic seed free • Non-selective (Glyphosate) herbicide is applied on weeds on main road and yard areas. No herbicide is used on peat fields, ditches, internal field roads or anywhere peat is stockpiled • Restricting recreational or third party activity • Revegetation (see Peatland Recovery Plan)

APPENDIX C

Appendix C. Summary of Sun Gro's Manitoba Peat Harvest Licences
 Sun Gro Horticulture Canada Ltd.
 All Manitoba PHLs
 Project #: 18N-01649

Area	Peat Harvest Licence	Issue Date	Valid Until	Licence Group	Sub-area	Active Harvest
East	PHL 1	June 15, 2015	December 31, 2030	Caribou Cluster	Caribou Cluster N	No
					Caribou Cluster E	No
					Caribou Cluster W	No
	PHL 3	June 15, 2015	December 31, 2030	Julius	Elma	Yes
					South Julius 2	Yes
					South Julius 1	No
					Julius Lake West	No
					North Julius	Yes
					Moss Spur 1	No
					Moss Spur 2	Yes
					Moss Spur 3	No
					Evergreen 1	No
					Evergreen 2	Yes
Evergreen 3	Yes					
Interlake	PHL 4	June 15, 2015	December 31, 2030	South Washow	Sugar Creek A	No
					Sugar Creek B	No
					Sugar Creek C	No
					Sugar Creek D	No
					Sugar Creek E	No
					Ramsay Point	Yes
	PHL 5	June 15, 2015	December 31, 2030	Kinwow Bay	Kinwow Bay A	No
					Kinwow Bay B	No
					Kinwow Bay C	No
					Kinwow Bay D	No
					Kinwow Bay E	No
					Kinwow Bay F	No
	PHL 6	June 15, 2015	December 31, 2030	North Washow	Birch Lake	No
					South Bullhead	No
					Biscuit Harbour	No
					North Moose Lake A	No
					North Moose Lake B	No

APPENDIX D

DATE: 2018-06-05

TO: **Jasmine LAMARRE**
 Environmental Scientist
 Monitoring and Reclamation
 Vertex Resource Group
 Sherwood Park, AB
 T8H 0G2

FROM: **Suyoko Anne TSUKAMOTO**
Impact Assessment Archaeologist
 Historic Resources Branch
 Main Floor – 213 Notre Dame Avenue
 Winnipeg, Manitoba, R3B 1N3

CC: **Perry BLOMQUIST**
 Archaeological Services Officer
 Historic Resources Branch

PHONE NO: (204) 945-2118
 FAX: (204) 948-2384
 E-MAIL: Suyoko.Tsukamoto@gov.mb.ca

SUBJECT: **Heritage Resource Screening Request - Peatland Harvest Licenses**
HRB File #: AAS-18-13137

Concerns.

Further to your e-mail regarding the above-noted peat harvesting sections, the Historic Resources Branch has examined the location in conjunction with Branch records for areas of potential concern. Several of the proposed harvest blocks are adjacent to bodies of water and/or lakeshores. A preliminary assessment of archaeological site patterns in the region suggest that any future planned development within the areas surrounding bodies of water have the potential to impact heritage resources, therefore, the Historic Resources Branch has concerns. The sections for potential heritage concerns have been identified in the table below.

Table: List of Peat Harvest Blocks Identified for Potential Heritage Concerns

05-33-01 EPM	PHL 5	Kinwow Bay	Kinwow Bay - A	concern	SW, east 1/2
06-33-01 EPM	PHL 5	Kinwow Bay	Kinwow Bay - A	concern	NE
32-32-01 EPM	PHL 5	Kinwow Bay	Kinwow Bay - A	concern	NW, east 1/2
30-32-01 EPM	PHL 5	Kinwow Bay	Kinwow Bay - B	concern	NW & SW, W 1/2
31-32-01 EPM	PHL 5	Kinwow Bay	Kinwow Bay - B	concern	NW, west 1/2
30-32-01 WPM	PHL 5	Kinwow Bay	Kinwow Bay - C	concern	NE, N 1/2
29-31-01 WPM	PHL 5	Kinwow Bay	Kinwow Bay - D	concern	SW
25-31-01 WPM	PHL 5	Kinwow Bay	Kinwow Bay - E	concern	NE
11-31-01 WPM	PHL 5	Kinwow Bay	Kinwow Bay - F	concern	NE, W 1/2
13-31-01 WPM	PHL 5	Kinwow Bay	Kinwow Bay - F	concern	SW
28-31-01 WPM	PHL5	Kinwow Bay	Kinwow Bay – D	concern	N ½, SW
01-31-04 EPM	PHL 6	North Washow	Biscuit Harbour	concern	SW & SE, S 1/2
35-30-04 EPM	PHL 6	North Washow	Biscuit Harbour	concern	NE
36-30-04 EPM	PHL 6	North Washow	Biscuit Harbour	concern	NW
36-30-04 EPM	PHL 6	North Washow	Biscuit Harbour	concern	NW
02-31-04 EPM	PHL 6	North Washow	Biscuit Harbour	concern	SE
11-31-05 EPM	PHL 6	North Washow	South Bullhead	concern	NW
14-31-05 EPM	PHL 6	North Washow	South Bullhead	concern	SW

Under Section 12(2) of The Heritage Resources Act, if the Minister of Sport, Culture and Heritage has reason to believe that heritage resources or human remains are known, or thought likely to be present, on lands that are to be developed, then the owner/developer is required to conduct at his/her own expense, a heritage resource impact assessment (HRIA) and mitigation, if necessary, prior to the project's start.

The developer must contract a qualified archaeological consultant to conduct a Heritage Resources Impact assessment (HRIA) of the proposed development location, in order to identify and assess any heritage resources that may be negatively impacted by development. If desirable, the Branch will work with the developer/land owners and its consultant to draw up terms of reference for this project.

If you have any further questions or comments, please feel free to contact the Branch as above.

Manitoba Historic Resources Branch
Archaeological Assessment Services

APPENDIX E

Appendix E. Manitoba Conservation Data Centre Rare Species Database Results

Sun Gro Horticulture Canada Ltd.

All Manitoba PHLs

Project #: 18N-01649

Category	Scientific Name	Common Name	S Rank	ESEA ¹	SARA ²	COSEWIC ³	2-12-10E	3-12-10E	21-5-16E	4-28-4E	11-30-5E	10-31-5E
Plant	<i>Pogonia ophioglossoides</i>	Rose pogonia	S1	-	-	-	X	-	-	-	-	-
Plant	<i>Platanthera lacera</i>	Fringed orchid	S1S2	-	-	-	X	-	-	-	-	-
Plant	<i>Cladium mariscoides</i>	Twig rush	S2S3	-	-	-	-	X	-	-	-	-
Plant	<i>Chelone glabra</i>	Turtlehead	S2	-	-	-	-	-	X	-	-	-
Plant	<i>Calopogon tuberosus</i>	Tuberous grass-pink	S2	-	-	-	-	-	-	X	-	-
Plant	<i>Rhynchospora alba</i>	White beakrush	S3	-	-	-	-	-	-	-	X	-
Bird	<i>Cardellina canadensis</i>	Canada warbler	S3B	-	Threatened	Threatened	-	-	-	-	-	X

¹Endangered Species and Ecosystems Act

²Species at Risk Act

³Committee on the Status of Endangered Wildlife in Canada